



Service Manual

# Service Manual

## KU310



Model : KU310



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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of commoncarrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the  sign. Following information is ESD handling:

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

## 2. PERFORMANCE

### 2.1 System Overview

Item	Specification
Shape	GSM900/1800/1900 and WCDMA Folder Handset
Size	93.7 X 49.0 X 18.6 mm
Weight	87 g (with 800mAh Battery)
Power	4.0V normal, 800 mAh Li-Polymer
Talk Time	Over 125 min (WCDMA, Tx=12 dBm, Voice)
(with 800mAh)	Over 160 min (GSM, Tx=Max, Voice)
Standby Time	Over 200 Hrs (WCDMA, DRX=1.28)
(with 800mAh)	Over 200 Hrs (GSM, Paging period=9)
Antenna	Internal type
LCD	Main 176 X 220 pixel (TFT) / sub 96 X 96 pixel (OLED)
LCD Backlight	White LED Back Light (Main)
Camera	1.3 Mega pixel (CMOS)
Vibrator	Yes (Coin Type)
LED Indicator	No
MIC	Yes
Receiver	Yes
Earphone Jack	Yes (18 pin)
Connectivity	Bluetooth, USB
Volume Key	Push Type(+, -)
External Memory	Trans-Flash
I/O Connect	18 Pin MMI

## 2. PERFORMANCE

### 2.2 Usable environment

#### 1) Environment

Item	Specification
Voltage	4.0 V(Typ), 3.38 V(Min), [Shut Down : 3.28 V]
Operation Temp	-20 ~ +60°C
Storage Temp	-20 ~ +70°C
Humidity	85 % (Max)

#### 2) Environment (Accessory)

Reference	Spec.	Min	Typ.	Max	Unit
TA Power	Available power	100	220	240	Vac

\* CLA : 12 ~ 24 V(DC)

### 2.3 Radio Performance

#### 1) Transmitter - GSM Mode

No	Item		GSM		DCS & PCS	
1	Conducted  Spurious  Emission	MS allocated  Channel	100k~1GHz	-39dBm	9k ~ 1GHz	-39dBm
					1G~[A]MHz	-33dBm
			1G~12.75GHz	-33dBm	[A]M~[B]MHz	-39dBm
					[B]M~12.75GHz	-33dBm
		Idle Mode	100k~880MHz	-60dBm	100k~880MHz	-60dBm
			880M~915MHz	-62dBm	880M~915MHz	-62dBm
			915M~1GHz	-60dBm	915M~1GHz	-60dBm
			1G~[A]MHz	-50dBm	1G~[A]MHz	-50dBm
			[A]M~[B]MHz	-56dBm	[A]M~[B]MHz	-56dBm
			[B]M~12.5GHz	-50dBm	[B]M~12.5GHz	-50dBm

\* In case of DCS : [A] -> 1710, [B] -> 1785

\* In case of PCS : [A] -> 1850, [B] -> 1910

## 2. PERFORMANCE

No	Item		GSM		DCS & PCS	
2	Radiated Spurious Emission	MS allocated  Channel	30M ~ 1GHz	-36dBm	30M~1GHz	-36dBm
					1G~[A]MHz	-30dBm
			1G ~ 4GHz	-30dBm	[A]M~[B]MHz	-36dBm
					[B]M~4GHz	-30dBm
		Idle Mode	30M ~ 880MHz	-57dBm	30M~880MHz	-57dBm
			880M ~ 915MHz	-59dBm	880M~915MHz	-59dBm
			915M~1GHz	-57dBm	915M~1GHz	-57dBm
			1G~[A]MHz	-47dBm	1G~[A]MHz	-47dBm
[A]M~[B]MHz	-53dBm		[A]M~[B]MHz	-53dBm		
[B]M~4GHz	-47dBm		[B]M~4GHz	-47dBm		
3	Frequency Error		±0.1ppm		±0.1ppm	
4	Phase Error		±5(RMS)		±5(RMS)	
			±20(PEAK)		±20(PEAK)	
5	Frequency Error  Under Multipath and Interference Condition		3dB below reference sensitivity		3dB below reference sensitivity	
			RA250 : ±200Hz		RA250: ±250Hz	
			HT100 : ±100Hz		HT100: ±250Hz	
			TU50 : ±100Hz		TU50: ±150Hz	
			TU3 : ±150Hz		TU1.5: ±200Hz	
6	Output RF Spectrum	Due to  modulation	0 ~ 100kHz	+0.5dB	0 ~ 100kHz	+0.5dB
			200kHz	-30dB	200kHz	-30dB
			250kHz	-33dB	250kHz	-33dB
			400kHz	-60dB	400kHz	-60dB
			600 ~ 1800kHz	-66dB	600 ~ 1800kHz	-60dB
			1800 ~ 3000kHz	-69dB	1800 ~ 6000kHz	-65dB
			3000 ~ 6000kHz	-71dB	≥6000kHz	-73dB
			≥6000kHz	-77dB		
		Due to  Switching transient	400kHz	-19dB	400kHz	-22dB
			600kHz	-21dB	600kHz	-24dB
			1200kHz	-21dB	1200kHz	-24dB
			1800kHz	-24dB	1800kHz	-27dB

\* In case of DCS : [A] -> 1710, [B] -> 1785

\* In case of PCS : [A] -> 1850, [B] -> 1910



## 2. PERFORMANCE

No	Item	GSM			DCS & PCS		
7	Intermodulation attenuation		—		Frequency offset	800kHz	
					Intermodulation product should be Less than 55dB below the level of Wanted signal		
8	Transmitter Output Power	Power control	Power	Tolerance	Power control	Power	Tolerance
		Level	(dBm)	(dB)	Level	(dBm)	(dB)
		5	33	±3	0	30	±3
		6	31	±3	1	28	±3
		7	29	±3	2	26	±3
		8	27	±3	3	24	±3
		9	25	±3	4	22	±3
		10	23	±3	5	20	±3
		11	21	±3	6	18	±3
		12	19	±3	7	16	±3
		13	17	±3	8	14	±3
		14	15	±3	9	12	±4
		15	13	±3	10	10	±4
		16	11	±5	11	8	±4
		17	9	±5	12	6	±4
		18	7	±5	13	4	±4
		19	5	±5	14	2	±5
					15	0	±5
9	Burst timing	Mask IN			Mask IN		

## 2. PERFORMANCE

### 2) Transmitter - WCDMA Mode

No	Item	Specification
1	Maximum Output Power	Class 3 : +24dBm(+1/-3dB) Class 4 : +21dBm(±2dB)
2	Frequency Error	±0.1ppm
3	Open Loop Power control in uplink	±9dB@normal, ±12dB@extreme
4	Inner Loop Power control in uplink	Adjust output(TPC command)
		cmd      1dB      2dB      3dB
		+1      +0.5/1.5      +1/3      +1.5/4.5
		0      -0.5/+0.5      -0.5/+0.5      -0.5/+0.5
		-1      -0.5/-1.5      -1/-3      -1.5/-4.5
		Group (10 equal command group)
		+1      +8/+12      +16/+24
5	Minimum Output Power	-50dBm(3.84MHz)
6	Out-of-synchronization handling of output power	Qin/Qout : PCCH quality levels Toff@DPCCH/lor : -22 -> -28dB Ton@DPCCH/lor : -24 -> -18dB
7	Transmit OFF Power	-56dBm(3.84MHz)
8	Transmit ON/OFF Time Mask	±25us PRACH,CPCH,uplink compressed mode
9	Change of TFC	±25us Power varies according to the data rate DTX : DPCH off (minimize interference between UE)
10	Power setting in uplink compressed	±3dB(after 14slots transmission gap)
11	Occupied Bandwidth(OBW)	5MHz(99%)
12	Spectrum emission Mask	-35-15*(Δf-2.5)dBc@ Δf=2.5~3.5MHz,30k -35-1*(Δf-3.5)dBc@ Δf=3.5~7.5MHz,1M -39-10*(Δf-7.5)dBc@ Δf=7.5~8.5MHz,1M -49dBc@ Δf=8.5~12.5MHz,1M

## 2. PERFORMANCE

No	Item	Specification
13	Adjacent Channel Leakage Ratio(ACLR)	33dB@5MHz, ACP>-50dBm 43dB@10MHz, ACP>-50dBm
14	Spurious Emissions (*: additional requirement)	-36dBm@f=9~150KHz, 1K BW -36dBm@f=50KHz~30MHz, 10K BW -36dBm@f=30MHz~1000MHz, 100K BW -30dBm@f=1~12.5GHz, 1M BW (*)-41dBm@f=1893.5~1919.6MHz, 300K (*)-67dBm@f=925~935MHz, 100K BW (*)-79dBm@f=935~960MHz, 100K BW (*)-71dBm@f=1805~1880MHz, 100K BW
15	Transmit Intermodulation	-31dBc@5MHz, Interferer -40dBc -41dBc@10MHz, Interferer -40dBc
16	Error Vector Magnitude (EVM)	17.5%(>-20dBm) (@12.2K, 1DPDCH+1DPCCH)
17	Transmit OFF Power	-15dB@SF=4.768Kbps, Multi-code transmission

### 3)Receiver - GSM Mode

No	Item		GSM	DCS & PCS
1	Sensitivity (TCH/FS Class II)		-105dBm	-105dBm
2	Co-Channel Rejection (TCH/FS Class II, RBER, TU high/FH)		C/Ic=7dB	Storage -30 ~ +85
3	Adjacent Channel Rejection	200kHz	C/Ia1=-12dB	C/Ia1=-12dB
		400kHz	C/Ia2=-44dB	C/Ia2=-44dB
4	Intermodulation Rejection		Wanted Signal :-98dBm 1st interferer:-44dBm 2nd interferer:-45dBm	Wanted Signal :-96dBm 1st interferer:-44dBm 2nd interferer:-44dBm
5	Blocking Response (TCH/FS Class II, RBER)		Wanted Signal :-101dBm Unwanted : Depend on Frequency	Wanted Signal :-101dBm Unwanted : Depend on Frequency

### 4) Receiver - WCDMA Mode

No	Item	Specification
1	Reference Sensitivity Level	-106.7 dBm(3.84 MHz)
2	Maximum Input Level	-25dBm(3.84MHz) -44dBm/3.84MHz(DPCH_Ec) UE @ +20dBm output power(Class3)
3	Adjacent Channel Selectivity (ACS)	33dB UE @ +20dBm output power(Class3)
4	In-band Blocking	-56dBm/3.84MHz@10MHz UE @ +20dBm output power(Class3) -44dBm/3.84MHz@15MHz UE @ +20dBm output power(Class3)
5	Out-band Blocking	-44dBm/3.84MHz@f=2050~2095 and 2185~2230MHz UE @ +20dBm output power(Class3) -30dBm/3.84MHz@f=2025~2050 and 2230~2255MHz UE @ +20dBm output power(Class3) -15dBm/3.84MHz@f=1~2025 and 2255~12500MHz UE @ +20dBm output power(Class3)
6	Spurious Response	-44dBm CW UE @ +20dBm output power(Class3)
7	Intermodulation Characteristic	-46dBm CW@10MHz -46dBm/3.84MHz@20MHz UE @ +20dBm output power(Class3)
8	Spurious Emissions	-57dBm@f=9KHz~1GHz, 100K BW -47dBm@f=1~12.5GHz, 1M BW -60dBm@f=1920MHz~1980MHz, 3.84M BW -60dBm@f=2110MHz~2170MHz, 3.84M BW

## 2. PERFORMANCE

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### 2.4 Current Consumption

	Stand by	Voice Call	VT
<b>WCDMA</b>	Under 4.0 mA (DRX=1.28)	Under 384 mA (Tx=12dBm)	Under 533mA (Tx=12dBm)
<b>GSM</b>	Under 4 mA (Paging=5period) Under 5.7 mA (@Bluetooth Connected, Paging=5period)	Under 300 mA (Tx=Max)	

(Stand by and Voice Call Test Condition : Bluetooth off, LCD backlight Off)

(VT Test Condition : Speaker off, LCD backlight On)

### 2.5 RSSI BAR

Level Change	WCDMA	GSM
BAR 4 → 3	-88 ± 2 dBm	-91 ± 2 dBm
BAR 3 → 2	-98 ± 2 dBm	-96 ± 2 dBm
BAR 2 → 1	-108 ± 2 dBm	-101 ± 2 dBm
BAR 1 → 0	-112 ± 2 dBm	-106 ± 2 dBm

### 2.6 Battery BAR

Indication	Standby
Bar 4	Over 3.81 ± 0.05V
Bar 4 → 3	3.76 ± 0.05V
Bar 3 → 2	3.68 ± 0.05V
Bar 2 → 1	3.60 ± 0.05V
Bar 1 → Empty	3.45 ± 0.05V
Low Voltage, Warning message+ Blinking	3.47± 0.05V (Talk) / 3.45 ± 0.05V (Stand-by) [Interval : 3min(Stand-by) / 1min(Talk)]
Power Off	3.25 ± 0.05V

### 2.7 Sound Pressure Level

No	Test Item		Specification	
1	Sending Loudness Rating (SLR)	MS	8 ±3 dB	
2	Receiving Loudness Rating (RLR)		Nor	-4 ± 3 dB
			Max	-15 ± 3 dB
3	Side Tone Masking Rating (STMR)		Min	17 dB
4	Echo Loss (EL)		Min	40 dB
5	Idle Noise-Sending (INS)		Max	-64 dBm0p
6	Idle Noise-Receiving (INR)		Nor	Under -47 dBPA
			Max	Under -36 dBPA
7	Sending Loudness Rating (SLR)	Headset	8±3dB	
8	Receiving Loudness Rating (RLR)		Nor	-1 ±3 dB
			Max	-12 ±3 dB
9	Side Tone Masking Rating (STMR)		Min	25 dB
10	Echo Loss (EL)		Min	40 dB
11	Idle Noise-Sending (INS)		Max	-55 dBm0p
			Nor	Under -45 dBPA
			Max	Under -40 dBPA
13	TDMA Noise -. GSM : Power Level : 5 DCS/PCS : Power Level : 0 (Cell Power : -90 ~ -105 dBm)  -. Acoustic (Max Vol.) MS/Headset SLR : 8 ± 3dB MS/Headset RLR : -15 ± 3dB/-12 ± 3 (SLR/RLR : Mid-value setting)	MS and Headset	Max	Under -62 dBm

## 2. PERFORMANCE

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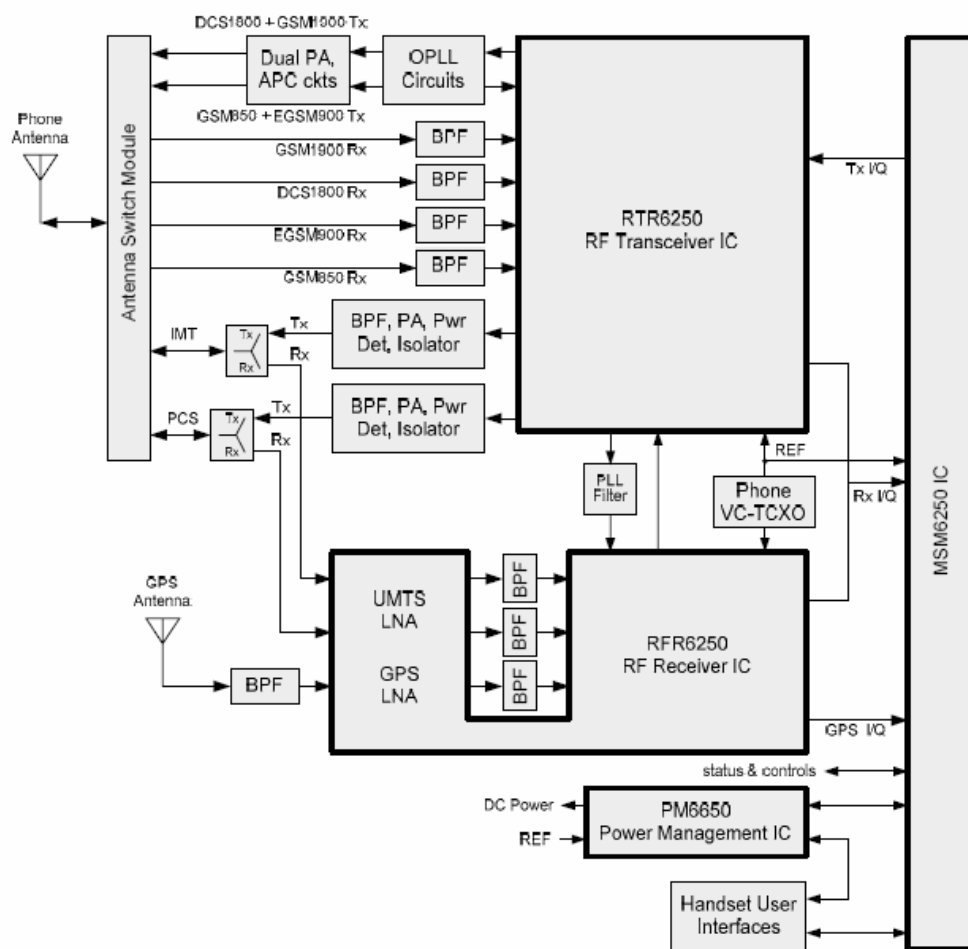
### 2.8 Charging

- **Charging Method** : CC & CV (Constant Current and Constant Voltage)
- **Maximum Charging Voltage** : 4.2 V
- **Maximum Charging Current** : 600 mA
- **Normal Battery Capacity** : 800 mAh
- **Charging Time** : Max 3 hours (except for trickle charging time)
- **Full charging indication current (charging icon stop current)** : 60 mA
- **Cut-off voltage** : 3.20 V

## 3. RF TECHNICAL BRIEF

### 3.1 General Description

The KU310 supports UMTS-2100 DS-WCDMA, EGSM-900, DCS-1800, and PCS-1900. All receivers and the UMTS transmitter use the radioOne<sup>1</sup>Zero-IF architecture to eliminate intermediate frequencies, directly converting signals between RF and baseband. The EGSM, DCS1800 and PCS1900 transmitters use a baseband-to-IF upconversion followed by an offset phase-locked loop that translates the GMSK-modulated signal to RF.



KU310 high-level RF functional block diagram

<sup>1</sup> QUALCOMM's branded chipset that implements a Zero-IF radio architecture.



### 3. TECHNICAL BRIEF

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A generic, high-level functional block diagram of KU310 is shown in Figure 1-1. One antenna collects base station forward link signals and radiates handset reverse link signals.

The antenna connects with receive and transmit paths through a switch module (plus a duplexer for UMTS-2100 operation).

UMTS band signals at the antenna are switched to the relevant UMTS duplexer. The UMTS receive band signals are amplified by the front-end LNAs of the RFR6250 IC before passing through a band-pass filter and being applied to the mixer inputs of the RFR6250 IC.

On-chip circuits down-convert the received signal directly from RF to baseband using radioOne Zero-IF techniques. Generation and distribution of the UMTS LO, for the downconverter, is performed entirely on-chip (except for the loop filter). The RFR6250 IC outputs analog baseband signals for processing by the MSM device. This baseband interface is shared with the RTR6250 GSM receiver outputs, but is separate from the GPS baseband interface.

EGSM, DCS and PCS receive signals from the antenna switch module pass through their band-pass filters, then are applied to the RTR6250 IC. In a similar fashion to the UMTS paths, RTR6250 IC circuits down-convert the received signals directly from RF to baseband. The GSM LO for multiband down conversion is entirely generated within the RTR6250 IC (PLL and distribution functions) with exception of the off-chip loop filter.

The RTR analog baseband outputs are routed to the MSM6250A IC for further processing (an interface shared with the RFR UMTS receive paths).

The UMTS transmit path begins with analog baseband signals from the MSM device that drive the RTR6250 IC. Integrated PLL and VCO circuits generate the Tx LO used in the quadrature upconverter that translates baseband signals directly to RF. The RTR6250 output driver stages deliver fairly high-level signals that are filtered and applied to the power amplifiers (PA). The PA output is routed to the antenna through a duplexer and switch module.

The shared EGSM-900, DCS-1800, and PCS-1900 transmit path begins with the same baseband interface from the MSM6250A IC that is used for the UMTS band. A single EGSM/DCS/PCS quadrature upconverter translates the GMSK-modulated signal to a convenient intermediate frequency (IF) that forms one input to an offset phase-locked loop (OPLL). OPLL functions are split between the RTR6250 IC and off-chip loop filter and dual Tx VCO circuits, and translate the GMSK-modulated signal to the desired EGSM-900, DCS-1800 or PCS-1900 channel frequency. This signal is applied to a dual power amplifier (only one is active at a time). The enabled path continues with the PA, an automated power control (APC) circuit that samples the transmit power and adjusts its level, the switch module (which includes a band-appropriate lowpass filter), and the antenna.

### 3. TECHNICAL BRIEF

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KU310 power supply voltages are managed and regulated by the PM6650 Power Management IC. This versatile device integrates all wireless handset power management, general housekeeping, and user interface support functions into a single mixed signal IC. It monitors and controls the external power source and coordinates battery recharging while maintaining the handset supply voltages using low dropout, programmable regulators.

The device's general housekeeping functions include an ADC and analog multiplexer circuit for monitoring on-chip voltage sources, charging status, and current flow, as well as user-defined off-chip variables such as temperature, RF output power, and battery ID. Various oscillator, clock, and counter circuits support IC and higher-level handset functions. Key parameters such as under-voltage lockout and crystal oscillator signal presence are monitored to protect against detrimental conditions.

## 3. TECHNICAL BRIEF

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### 3.2 GSM Mode

#### 3.2.1 GSM Receiver

The Dual-mode KU310's receiver functions are split between the two RFICs as follows:

- UMTS-2100 operation uses the RFR6250 Receiver ICs to implement the receive signal path, accepting an RF input and delivering analog baseband outputs (I and Q).
- EGSM-900, DCS-1800, and PCS-1900 modes both use the RTR6250 IC only. Each mode has independent front-end circuits and down-converters, but they share common baseband circuits (with only one mode active at a time). All receiver control functions are beginning with SBI<sup>2</sup>-controlled parameters.

The EGSM, DCS, and PCS receiver inputs of RTR6250 are connected directly to the transceiver front-end circuits(filters and antenna switch module). EGSM, DCS, and PCS receiver inputs are similar to the RFR6200 UMTS Rx input in that they also use differential configurations to improve common-mode rejection and second-order non-linearity performance. The balance between the complementary signals is critical and must be maintained from the RF filter outputs all the way into the IC pins Since EGSM, DCS, and PCS signals are time-division duplex (the handset can only receive or transmit at one time), switches are used to separate Rx and Tx signals in place of frequency duplexers - this is accomplished in the switch module.

The EGSM, DCS, and PCS receive signals are routed to the RTR6250 through band selection filters and matching networks that transform single-ended 50-Ω sources to differential impedances optimized for gain and noise figure. Similar to the RFR, the RTR input uses a differential configuration to improve second-order inter-modulation and common mode rejection performance. The RTR6250 input stages include MSM-controlled gain adjustments that maximize receiver dynamic range.

The amplifier outputs drive the RF ports of the quadrature RF-to-baseband downconverters.

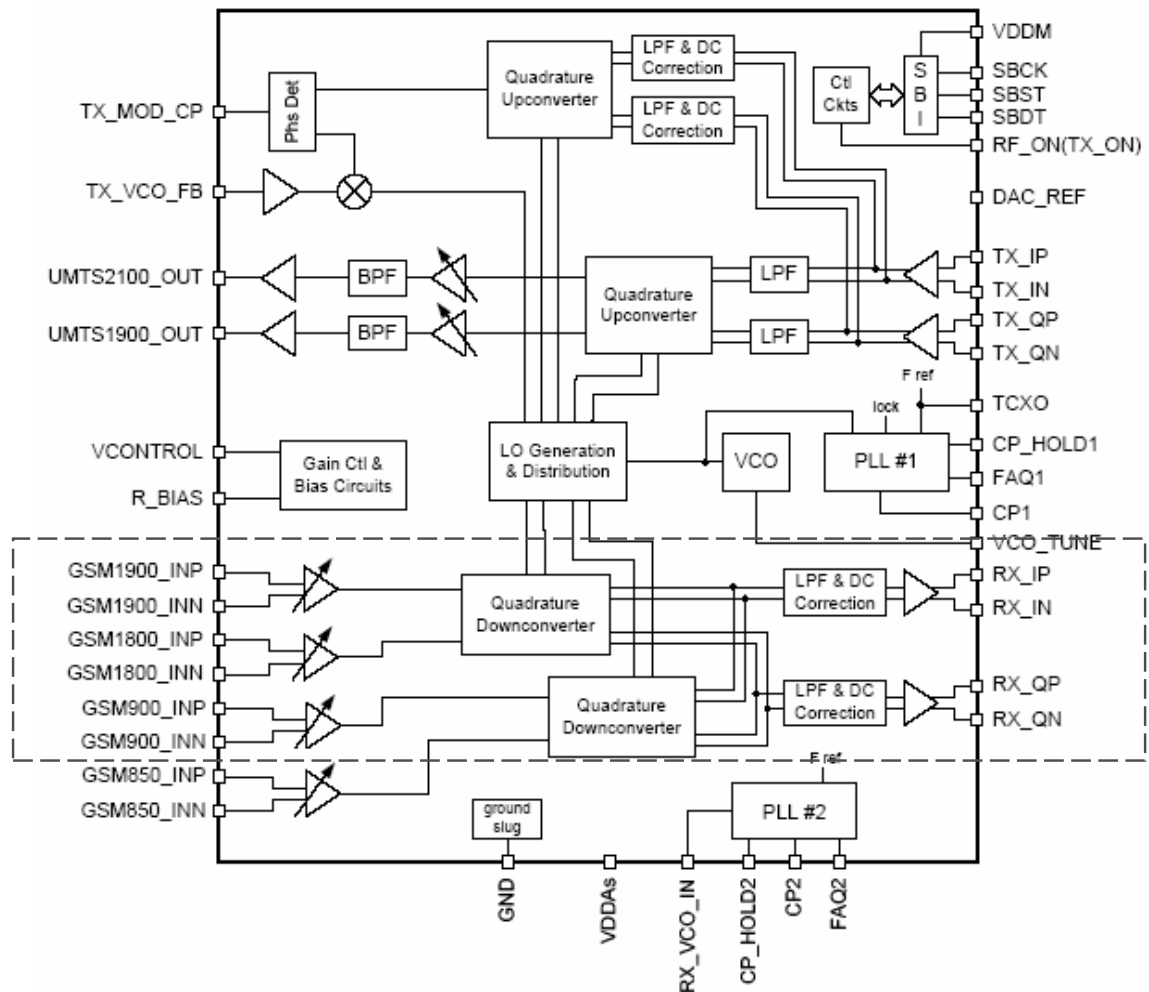
The downconverted baseband outputs are multiplexed and routed to lowpass filters (one I and one Q) having passband and stopband characteristics suitable for GMSK processing.

These filter circuits include DC offset corrections. The filter outputs are buffered and passed on to the MSM6250A IC for further processing (an interface shared with the RFR6200 UMTS receiver outputs).

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<sup>2</sup> The RFIC operating modes and circuit parameters are MSM-controlled through the proprietary 3-line Serial Bus Interface (SBI). The Application Programming Interface (API) is used to implement SBI commands. The API is documented in AMSS Software - please see applicable AMSS Software documentation for details.

### 3. TECHNICAL BRIEF



### 3. TECHNICAL BRIEF

#### 3.2.2 GSM Transmitter

The shared GSM Low-band (EGSM900) and High-band (DCS1800, PCS1900) transmit path begins with the baseband inputs from the MSM6250A IC. These differential analog input signals are buffered, lowpass filtered, corrected for DC offsets then applied to the GSM quadrature upconverter. The upconverter LO signals are generated from the transceiver VCO signal by the LO distribution and generation circuits within RTR6250. This upconverter translates the GMSK-modulated signal to a convenient intermediate frequency (IF) that forms one input to a frequency/phase detector circuit. This IF signal is the reference input to an offset phase-locked loop (OPLL) circuit as shown in Figure 3.2.2-1.

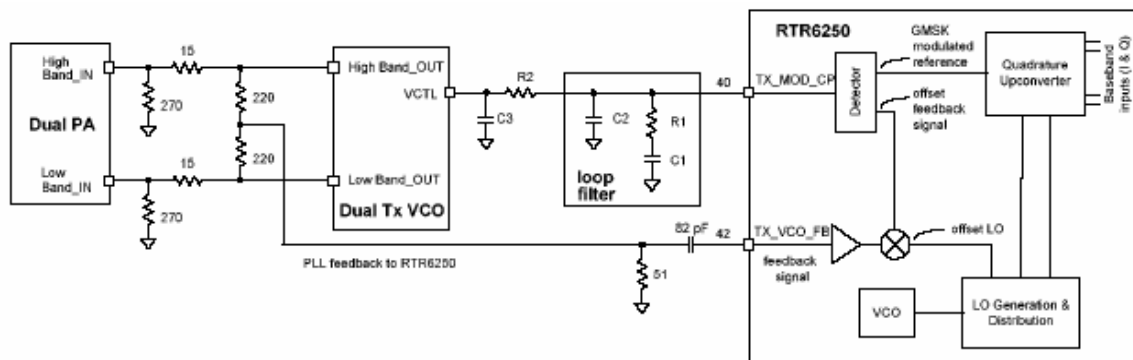


Figure 3.2.2-1 Offset phase-locked loop interfaces

The feedback path of this OPLL circuit includes a downconversion from the RF output frequency range to the IF range. The two inputs to this downconversion mixer are formed as follows:

1. The dual Tx VCO output (operating in the desired RF output frequency range) is buffered within the RTR6250 IC then applied to the mixer RF port.
2. The LO Generation and Distribution circuits that deliver the transmit path's LO for the baseband-to-IF upconversion also provides the .offset LO. signal that is applied to the feedback path's mixer LO port.

The mixer IF port output is the offset feedback signal - the *variable input* to the frequency/phase detector circuit. The detector compares its variable input to its reference input and generates an error signal that is lowpass filtered by the loop filter and applied to the dual Tx VCO tuning port to force the VCO output in the direction that minimizes errors.

As mentioned earlier, the VCO output is connected to the feedback path thereby creating a closed-loop control system that will force frequency and phase errors between the variable and reference inputs to zero.

The waveform at the dual Tx VCO output is the GMSK-modulated signal centered at the desired GSM channel frequency. A phase-locked loop circuit is used to translate the GMSK-modulated signal from IF to RF primarily for two reasons:

1. Phase-locked loops provide a lowpass filter function from the reference input to the VCO output. This results in a bandpass function centered at the desired channel frequency that provides steep, well-controlled rejection of the out-of-band spectrum.
2. The resulting output bandpass function is virtually unchanged as the transmitter is tuned over channels spanning the GSM operating band.

The PA is a key component in any transmitter chain and must complement the rest of the transmitter precisely. For GSM band operation, the closed-loop transmit power control functions add even more requirements relative to the UMTS PA. In addition to gain control and switching requirements, the usual RF parameters such as gain, output power level, several output spectrum requirements, and power supply current are critical. The gain must be sufficient and variable to deliver the desired transmitter output power given the VCO output level, the subsequent passive devices' losses, and the control set point. The maximum and minimum transmitter output power levels depend upon the operating band class and mobile station class per the applicable standard. Transmitter timing requirements and in-band and out-of-band emissions, all dominated by the PA, are also specified by the applicable standard.

The active dual Tx VCO output is applied to the dual power amplifier to continue the transmit path, and feedback to the RTR6250 IC to complete the frequency control loop. The PA operating band (EGSM or DCS/PCS) is selected by the MSM device GPIO control (GSM\_PA\_BAND).

### 3.3 WCDMA Mode

#### 3.3.1 Receiver

The UMTS duplexer receiver output is routed to LNA circuits within the RFR6250 IC. The LNA gain is dynamically controlled by the MSM6250A IC to cover full receiver dynamic range and to save current consumption.

The UMTS LNA output is routed to the down conversion mixer inputs, in the RFR6250 IC, through a band selection filter that transforms a single-ended 50-Ω source to differential 100-Ω load impedance that is matched to the RFR6250 IC. The RFR input uses a differential configuration to improve second-order inter-modulation and common mode rejection performance. The RFR6250 IC input stages include MSM-controlled gain adjustments that further extend receiver dynamic range.

### 3. TECHNICAL BRIEF

The amplifier output drives the RF port of the quadrature RF-to-baseband down-converter.

The down-converted baseband outputs are routed to low-pass filters (one I and one Q) having pass-band and stop-band characteristics suitable for DS-WCDMA processing. The filter outputs are buffered and passed on to the MSM6250A IC for further processing. This baseband interface is shared with the RTR6250 GSM receiver outputs.

The RFR6250 IC includes LO generation and distribution circuitry to reduce off-chip component requirements. The GPS RX LO source is created using the PLL control elements of the RTR6250 PLL2, via a discrete loop filter components, in tandem with the VCO in the RFR6250. Using only this PLL signal, the RFR6250 LO generation and distribution circuits create the necessary LO signals for the UMTS quadrature downconverter.

By definition, the ZIF down-converter requires  $F_{LO}$  equal to  $F_{RF}$ , and the RTR6250/RFR6250 design achieves this without allowing  $F_{VCO}$  to equal  $F_{RF}$ .

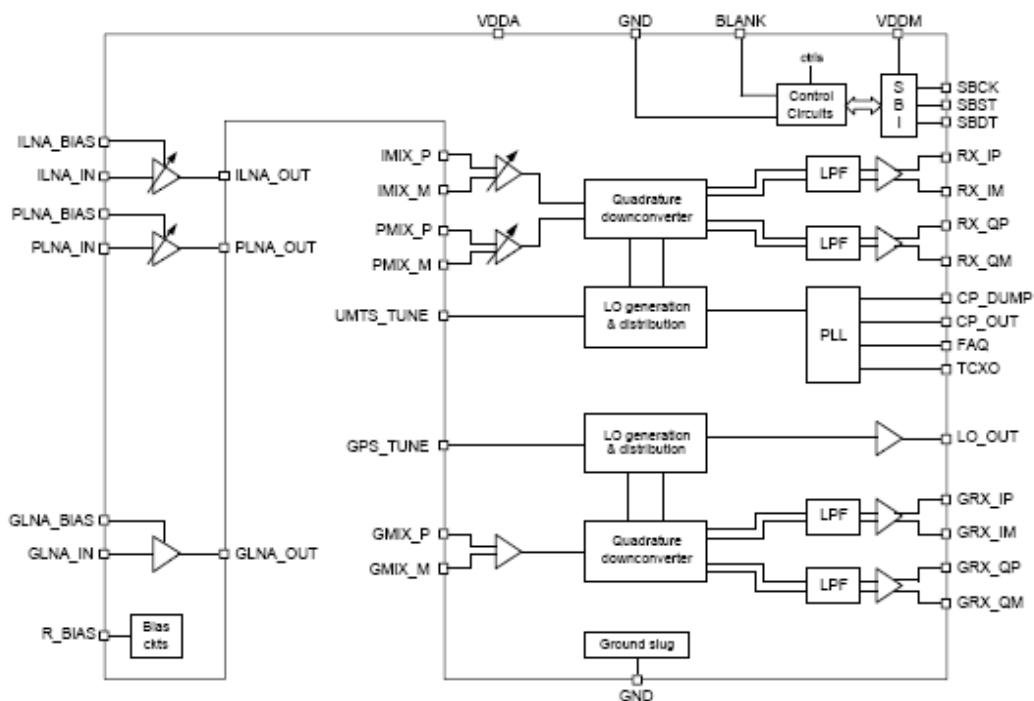


Figure 3.3.1-1 RFR6250 IC functional block diagram

### 3.3.2 Transmitter

The UMTS transmit path begins with analog baseband signals from the MSM device that drive the RTR6250 IC. The RTR6250 IC provides all the UMTS transmitter active signalpath circuits except the power amplifiers. Analog (I and Q) differential signals from the MSM device are buffered, filtered, and applied to Baseband-to-RF quadrature upconverters.

Gain control is implemented on-chip. The RF outputs include an integrated matching inductor, reducing the off-chip matching network to a single series capacitor.

The RTR6250 UMTS output is routed to its power amplifier through a bandpass filter, and delivers fairly high-level signals that are filtered and applied to the PA. Between The PA device output and Duplexer input KU310 has directional coupler. And this device in KU310 needs not to use isolator. Transmit power is delivered from the duplexer to the antenna through the switch module.

The RTR6250 IC integrates LO generation and distribution circuits on-chip, substantially reducing off-chip requirements. Various modes and programmable features result in a highly flexible transceiver LO output that supports not only UMTS transmissions, but all EGSM900 and DCS1800/PCS1900 Rx and Tx modes as well.

The UMTS Tx LO (PLL1) is generated almost entirely on-chip, requiring only the loop filter off-chip (two capacitors and two resistors); all UMTS Tx VCO and PLL circuits are on-chip. An internal RTR6250 switch routes the internal VCO signal to the LO generation and distribution circuits to create the necessary UMTS Tx LO signals.



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## 3.4 LO Phase-locked Loop

Most LO functions are fully integrated on-chip, do not require user adjustment, and need not be considered by handset designers. QUALCOMM has established and implemented frequency plans and LO generation schemes that support the radioOne 6250-IIseries chipset while requiring minimal off-chip design effort. Only one area requires handset designer attention: the loop filters of each phase-locked loop (PLL).

### 3.4.1 UMTS Receiver LO generation

All the active circuits necessary for generating the UMTS LO are integrated within the RFR6250 IC; only the passive loop filter is off-chip. The UMTS PLL and VCO are automatically disabled when the handset is not processing UMTS signals.

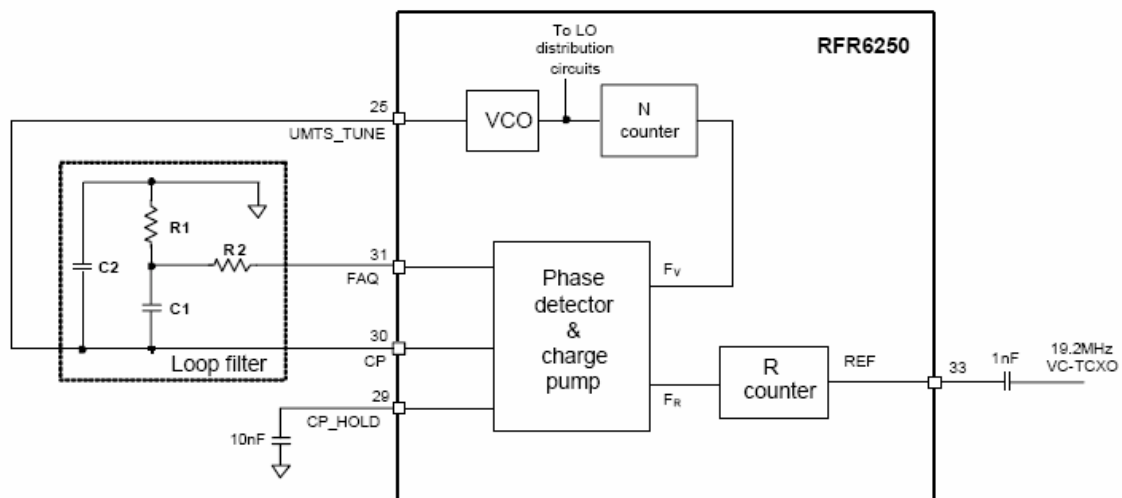


Figure 3.4.1-1 UMTS Rx PLL functional block diagram

All the UMTS PLL circuits are contained within the RFR6250 IC: reference divider, phase detector, charge pump, feedback divider, and digital logic that generate lock status. The VC-TCXO signal provides the synthesizer input (TCXO), the frequency reference to which the PLL is phase and frequency locked. The reference is divided by the R-counter to create a fixed frequency input to the phase detector, FR. The other phase detector input (FV) varies as the loop acquires lock, and is generated by dividing the VCO frequency using the feedback path's N-counter. The closed loop will force FV to equal FR when locked. If the loop is not locked the error between FV and FR will create an error signal at the output of the charge pump. This error signal is filtered by the external loop filter and applied to the UMTS VCO (at UMTS\_TUNE on the RFR6250 IC), tuning the output frequency such that the error is decreased. Ultimately, the loop forces the error to approach zero and the PLL is phase and frequency locked. The UMTS VCO signal is routed internally within the RTR6250 IC to the N-counter, closing the feedback path that allows the loop to lock.

The VCO output drives LO generation and distribution circuits (within the RFR6250 IC) to create the necessary LO signals for Rx quadrature down-converter for either UMTS band.

By definition, a Zero-IF down-converter requires FRF equal to FLO, and the RFR6250 design achieves this without allowing FVCO to equal FRF.

The tuning signal is routed off-chip for filtering, allowing optimization for different applications.

#### 3.4.2 Transceiver PLL (PLL1)

All LO functional blocks for the other handset modes(UMTS Tx, EGSM Tx/Rx, DCS Tx/Rx, PCS Tx/Rx) are integrated into the RTR6250 IC except the loop filter components (Figure 3.4.2-1). On-chip circuits include reference divider, phase detector, charge pump, VCO, feedback divider, and digital logic status. The functional description given in Section 3.4.1 for the UMTS Rx PLL applies to the Transceiver PLL as well.

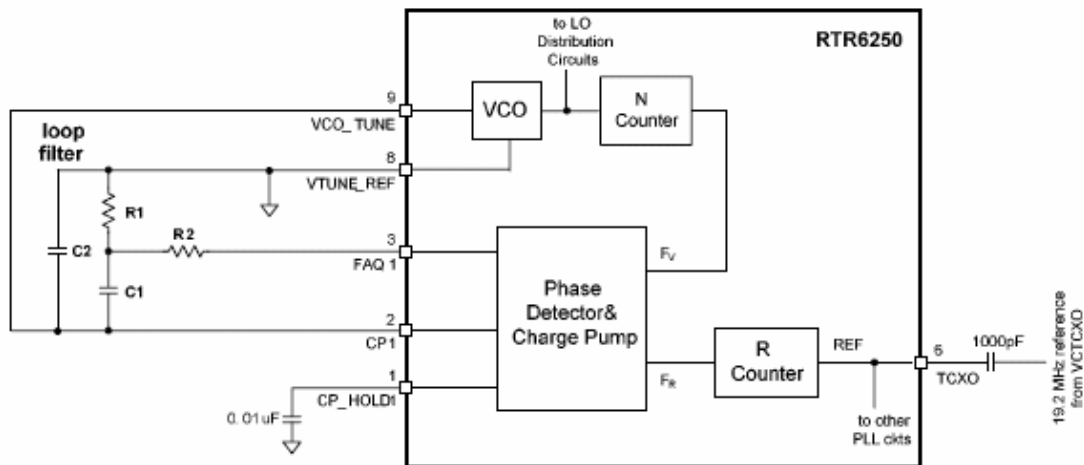


Figure 3.4.2-1 Transceiver PLL functional block diagram

The off-chip loop filter allows optimization of key PLL performance characteristics (stability, transitory response, settling time, and phase noise) for different applications. Guidelines are provided in the next subsection for proper implementation of this critical circuit.

## 3. TECHNICAL BRIEF

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### 3.5 Off-chip RF Components

#### 3.5.1 Front End Module(FL1000)

Front End module integrates antenna switch module and GSM Rx filter.

The antenna switch module allows multiple operating bands and modes to share the same antenna. In the KU310 design, a common antenna connects to one of six paths: 1) UMTS-2100 Rx/Tx, 2) EGSM Rx, 3) DCS-1800 Rx, 4) PCS-1900 Rx, 5)EGSM Tx, and 6) DCS-1800, PCS-1900 Tx. UMTS operation requires simultaneous reception and transmission, so the UMTS Rx/Tx connection is routed to a duplexer that separates receive and transmit signals. GSM band of operation is time division duplexed, so only the receiver or transmitter is active at any time and a frequency duplexer is not required. The module includes lowpass filters for the GSM bands transmit paths to reduce out-of-band emissions, PA harmonics in particular.

#### 3.5.2 UMTS duplexer (FL1003)

A UMTS duplexer splits a single operating band into receive and transmit paths. Important performance requirements include:

- Insertion loss . this component is also in the receive and transmit paths; In the KU310 typical losses: UMTS Tx = 1.5 dB, UMTS Rx = 2.3 dB.
- Out-of-band rejection or attenuation . the duplexer provides input selectivity for the receiver, output filtering for the transmitter, and isolation between the two. Rejection levels for both paths are specified over a number of frequency ranges. Two Tx-to-Rx isolation levels are critical to receiver performance:
- Rx-band isolation . the transmitter is specified for out-of-band noise falling into the Rx band. This noise leaks from the transmit path into the receive path, and must be limited to avoid degrading receiver sensitivity. The required Rx-band isolation depends on the PA out of-band noise levels and Rx-band losses between the PA and LNA. Typical duplexer Rx band isolation value is 42 dB.
- Tx-band isolation . the transmit channel power also leaks into the receiver. In this case, the leakage is outside the receiver passband but at a relatively high level. It combines with Rx band jammers to create cross-modulation products that fall in-band to desensitize the receiver. The required Tx-band isolation depends on the PA channel power and Tx-band losses between the PA and LNA. Typical duplexer Tx-band isolation value is 50 dB.
- Passband ripple . the loss of this fairly narrowband device is not flat across its passband. Passband ripple increases the receive or transmit insertion loss at specific frequencies, creating performance variations across the band channels, and should be controlled.
- Return loss . minimize mismatch losses with typical return losses of 10 dB or more (VSWR <2:1).

### 3.5.3 UMTS Power Amplifier (U1002)

The WS2512TR1G meets the increasing demands for higher output power in UMTS handsets. The PA module is optimized for  $V_{REF} = +2.85\text{ V}$ , a requirement for compatibility with the Qualcomm® 6250 chipset. The device is manufactured on an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. Selectable bias modes that optimize efficiency for different output power levels, and a shutdown mode with low leakage current, increase handset talk and standby time. The self-contained 4 mm x 4 mm x 1.1 mm surface mount package incorporates matching networks optimized for output power, efficiency, and linearity in a  $50\ \Omega$  system.

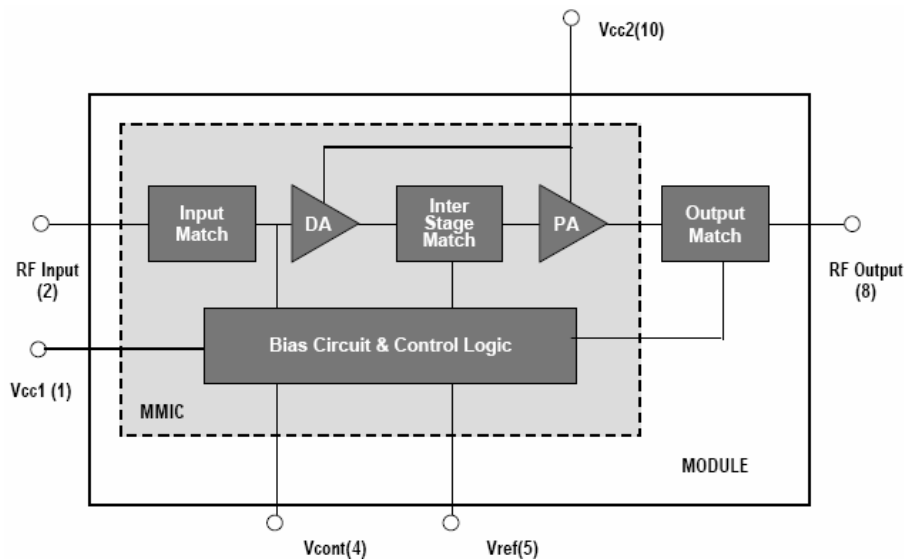


Figure.3.5.3-1 UMTS PA functional block diagram

### 3. TECHNICAL BRIEF

#### 3.5.4 Thermistor (R1032)

This thermistor senses temperature variations around UMTS PA to adjust PA gain deviation for assure compliance with the applicable transmit power control standards. Negative temperature compensation thermistor is used in the KU310.

#### 3.5.5 UMTS transmit power detector (U1003)

This detector couples PA output power level to calibrate the transmitter characteristic over the channel variation and temperature. Its detector coupling range and converted voltage is based on diode sensitivity and transmitter power level.

The KU310 uses National Semiconductor LMV228TLX power detector IC. In Figure 3.5.5-1, Directional coupler is set to 18dB tap coupling. The output voltage is proportional to the logarithm of the input power. Figure3.5.5-2 shows the output voltage versus PA output power of the LMV228TLX setup as depicted in Figure1.5.5-1

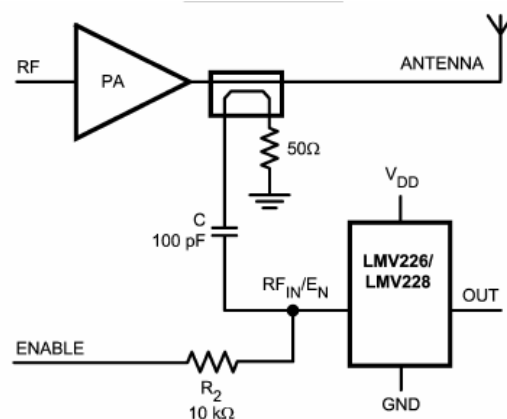


Figure 3.5.5-1 Block diagram of LMV228TLX Typical Application

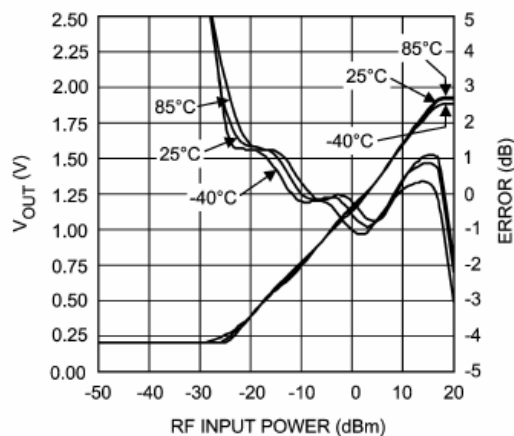


Figure 3.5.5-2 Power detector response, Vout vs PA output power

#### 3.5.6 Dual band GSM power amplifier (U1001)

The SKY77318 Power Amplifier Module (PAM) is designed in a low profile (1.2 mm), compact form factor for tri-band cellular handsets comprising GSM900, DCS1800, and PCS1900 operation. The PAM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of separate GSM900 PA and DCS1800/PCS1900 PA blocks, impedance-matching circuitry for 50  $\Omega$  input and output impedances, and a Power Amplifier Control (PAC) block with an internal current-sense resistor. The custom BiCMOS integrated circuit provides the internal PAC function and interface circuitry.

Fabricated onto a single Gallium Arsenide (GaAs) die, one Heterojunction Bipolar Transistor (HBT) PA block supports the GSM900 bands and the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The GaAs die, the Silicon (Si) die, and the passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

RF input and output ports of the SKY77318 are internally matched to a 50  $\Omega$  load to reduce the number of external components for a quad-band design. Extremely low leakage current (2.5  $\mu$ A, typical) of the dual PA module maximizes handset standby time. The SKY77318 also contains band-select switching circuitry to select GSM (logic 0) or DCS/PCS (logic 1) as determined from the Band Select (BS) signal. In Figure 3.5.6-1 below, the BS pin selects the PA output (DCS/PCS OUT or GSM900 OUT) and the Analog Power Control (VAPC) controls the level of output power.

The VBATT pin connects to an internal current-sense resistor and interfaces to an integrated power amplifier control (iPAC™) function, which is insensitive to variations in temperature, power supply, process, and input power. The ENABLE input allows initial turn-on of PAM circuitry to minimize battery drain.

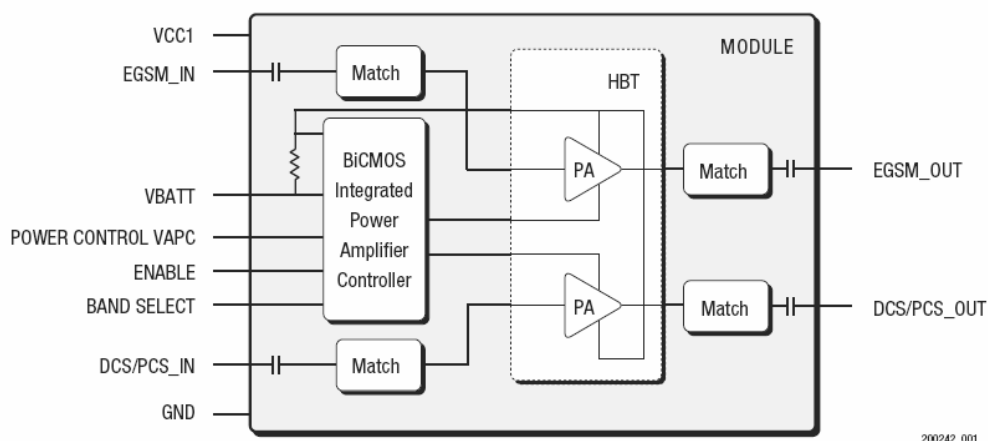


Figure 3.5.6-1 GSM PA functional block diagram

### 3. TECHNICAL BRIEF

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#### 3.5.7 GSM transmit VCO (X1000)

The dual Tx VCO is a key component within the GSM OPLL. This VCO performance directly impacts PLL and transmitter performance. VCO specifications refer to muRata MQW6V0C869M datasheet.

The dual Tx VCO outputs, one for Low-band GSM and one for high band, drive a resistive network that splits the active signal into two signals: 1) the input to the active PA . this is the low loss path, and 2) the OPLL feedback signal . this is the high loss path. See Figure 8-1 for recommended topology and resistor values.

The losses from the VCO outputs to the PA inputs must be factored into the output chain.spower budget. Each path includes a  $\pi$ -pad that introduces approximately a 3-dB loss. The low band GSM  $\pi$ -pad is formed by R1022 plus R1020, R1018, and R1015; the high band GSM  $\pi$ -pad is formed by R1012 plus R1008, R1013, and R1015. One leg of each  $\pi$ -pad is used to couple the VCO output to form the feedback path as described below.

For a given VCO output drive level, the loss to the RTR6250 input must assure the specified input level is achieved (-18 to -12 dBm). Large resistors included in the  $\pi$ -pads are used to lightly couple off the VCO outputs to create the feedback signal. Since the RTR6250 TX\_VCO\_FB pin presents fairly high impedance, an external terminating resistor is required (R1015, 51  $\Omega$ ). A series capacitor (82 pF) AC couples the feedback signal into the RTR6250 IC.

#### 3.5.8 UMTS Rx RF filter (FL1001)

An RF filter is located between the UMTS LNA and mixer. Insertion loss is important, but not as critical as losses before the LNA. The most important parameters of this component include:

- Out-of-band rejection or attenuation levels, usually specified to meet these conditions:
  - Far out-of-band signals - ranging from DC up to the first band of particular concern and from the last band of particular concern to beyond three times the highest passband frequency.
  - Tx-band leakage - the transmitter channel power, although attenuated by the duplexer, still presents a cross-modulation threat in combination with Rx-band jammers. The RF filter must provide rejection of this Tx-band leakage.
  - Other frequencies of particular concern . bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.
- Phase and amplitude balance - the ZIF architecture requires well-balanced differential inputs to the RFR6250 IC. This is accomplished by the RF filter which takes a single-ended output from the RFL6250 IC and provides differential outputs having nominal 180° phase separation. Phase and/or amplitude imbalance causes degraded common-mode rejection and second-order nonlinearity, so their requirements are specified jointly.
  - $\pm 3$  degrees and  $\pm 1$  dB
  - -12 to + 3 degrees and  $\pm 0.7$  dB

Of course, passband ripple and return loss are still important in all cases for the same reasons

### 3.5.9 VCTCXO (X1001)

The Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) provides the reference frequency for all RFIC synthesizers as well as clock generation functions within the MSM6250A IC. The 6250-series chipset requires a 19.2 MHz nominal VCTCXO frequency. The oscillator frequency is controlled by the MSM6250A's TRK\_LO\_ADJ pulse density modulated signal in the same manner as the transmit gain control.

The filtered PDM signal results in an analog control signal into the VCTCXO tuning port whose voltage is directly proportional to the density of the digital bit stream. The MSM device varies the pulse density to change the analog control voltage that sets the oscillator frequency - all within a feedback control loop that minimizes handset frequency drift relative to the network.

### 3.5.10 Bluetooth (U703 : RB04,ANT700)

The MSM6250A includes BT baseband embedded BT 1.1 compliant baseband core, so the other bluetooth components are an bluetooth RF module and Antenna. Figure.3.5.10-1 shows the Bluetooth system architecture in the KU310.



### 3. TECHNICAL BRIEF

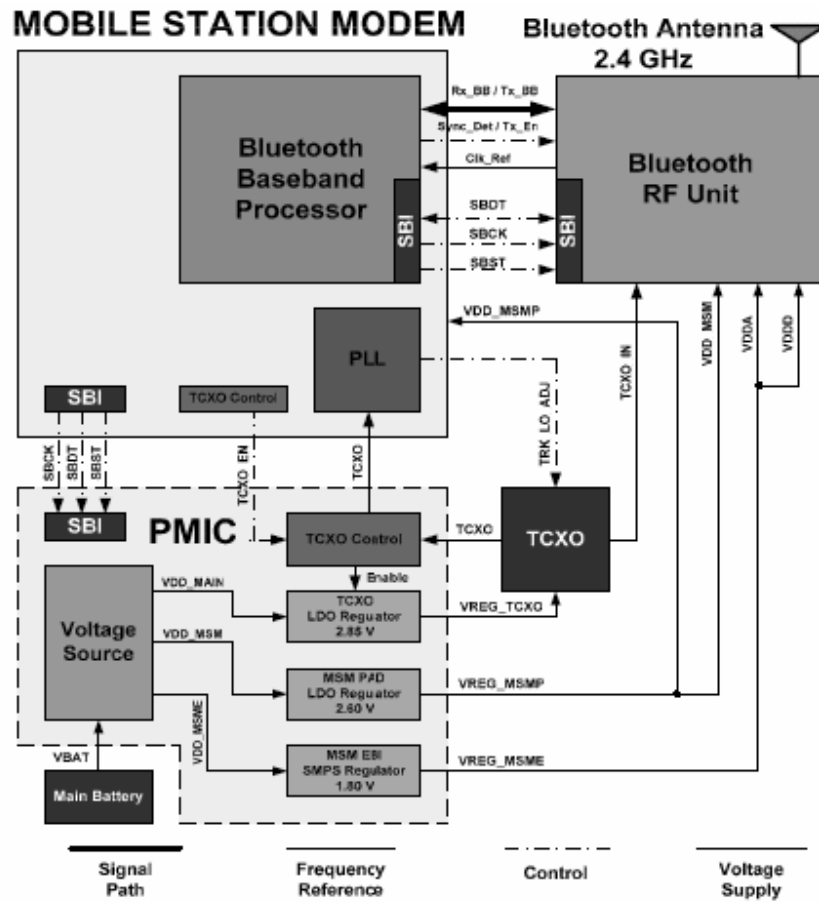


Figure 3.5.10-1 Bluetooth system architecture

### 3. BB Technical Description

#### 3.6 Digital Baseband(DBB/MSM6250A)

##### 3.6.1 General Description

###### A. Features(MSM6250A)

- The ARM926EJ-S microprocessor can operate at up to 180 MHz with variable rate, software controlled clocks to provide greater standby time.
- Integrated PLL to provide additional on-chip clock frequencies
- Supports low-power, low-frequency crystal to enable TCXO shutoff
- Integrated USIM Controller for direct interface to USIM card
- Software-controlled power management feature
- Automatic access conversion of 32-bit data accesses to 16-bit devices
- Advanced 409-ball CSP packaging
- WCDMA Access
  - Maximum of eight simultaneous transport channels
  - Four coded composite transport channels (CCTrCH)
  - PS data rates supporting 384kbps DL / 64kbps UL
- GSM/GPRS Access
  - GSM/GPRS network signaling (from Layer 1 to 3)
  - GSM AMR,EFR,FR
- Operation and Services
  - SIM Interfaces
  - General Purpose I/O (GPIO) Interface
  - Dual Memory Buses(EBI1 & EBI2)
  - JTAG
  - RTC
- Data Communication
  - UARTs (ACB, EDB (RS232))
  - Slave USB

### 3. TECHNICAL BRIEF

#### 3.7 Hardware Architecture

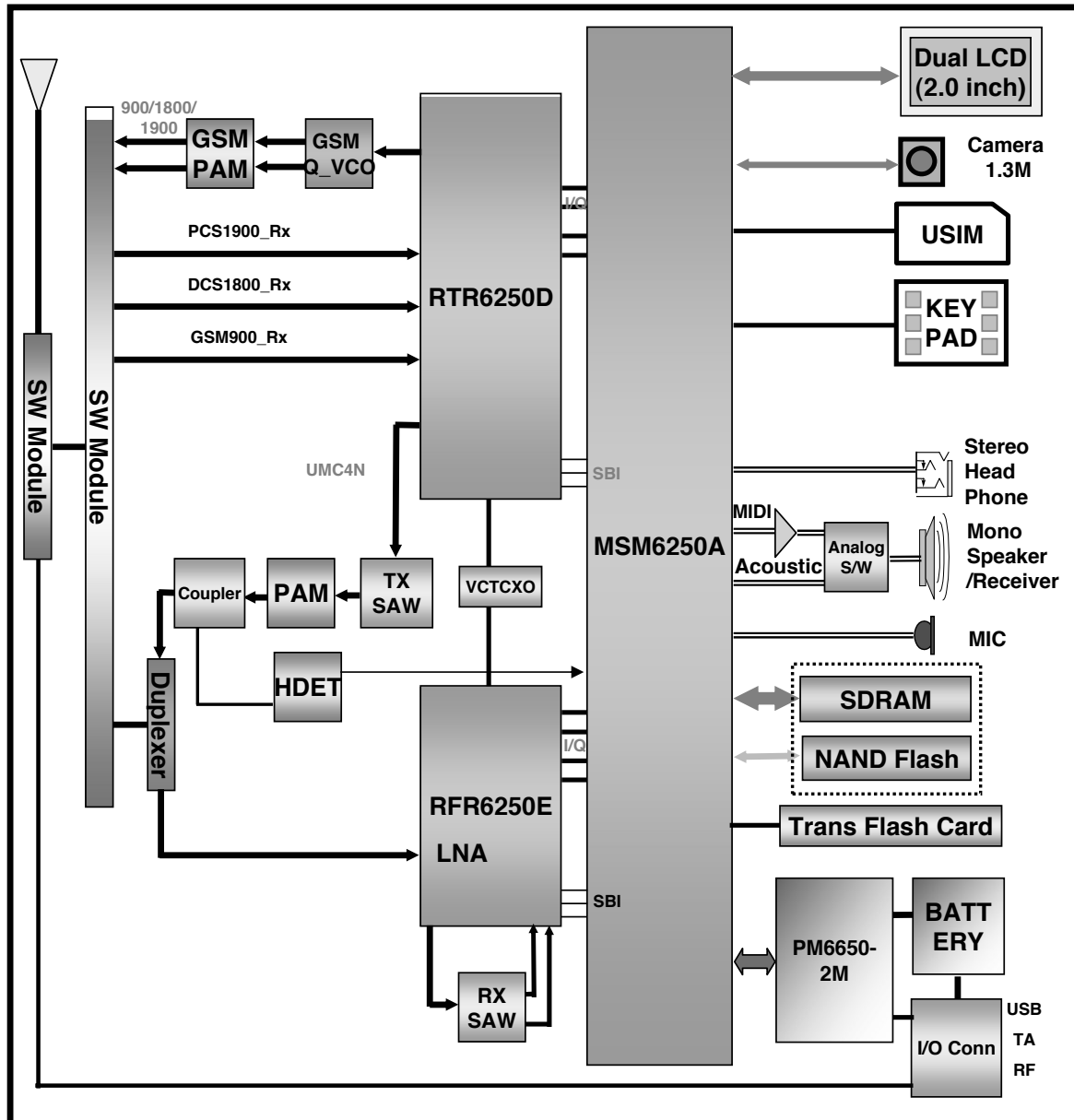


Figure. Simplified Block Diagram

#### 3.7.1. Block Diagram(MSM6250A)

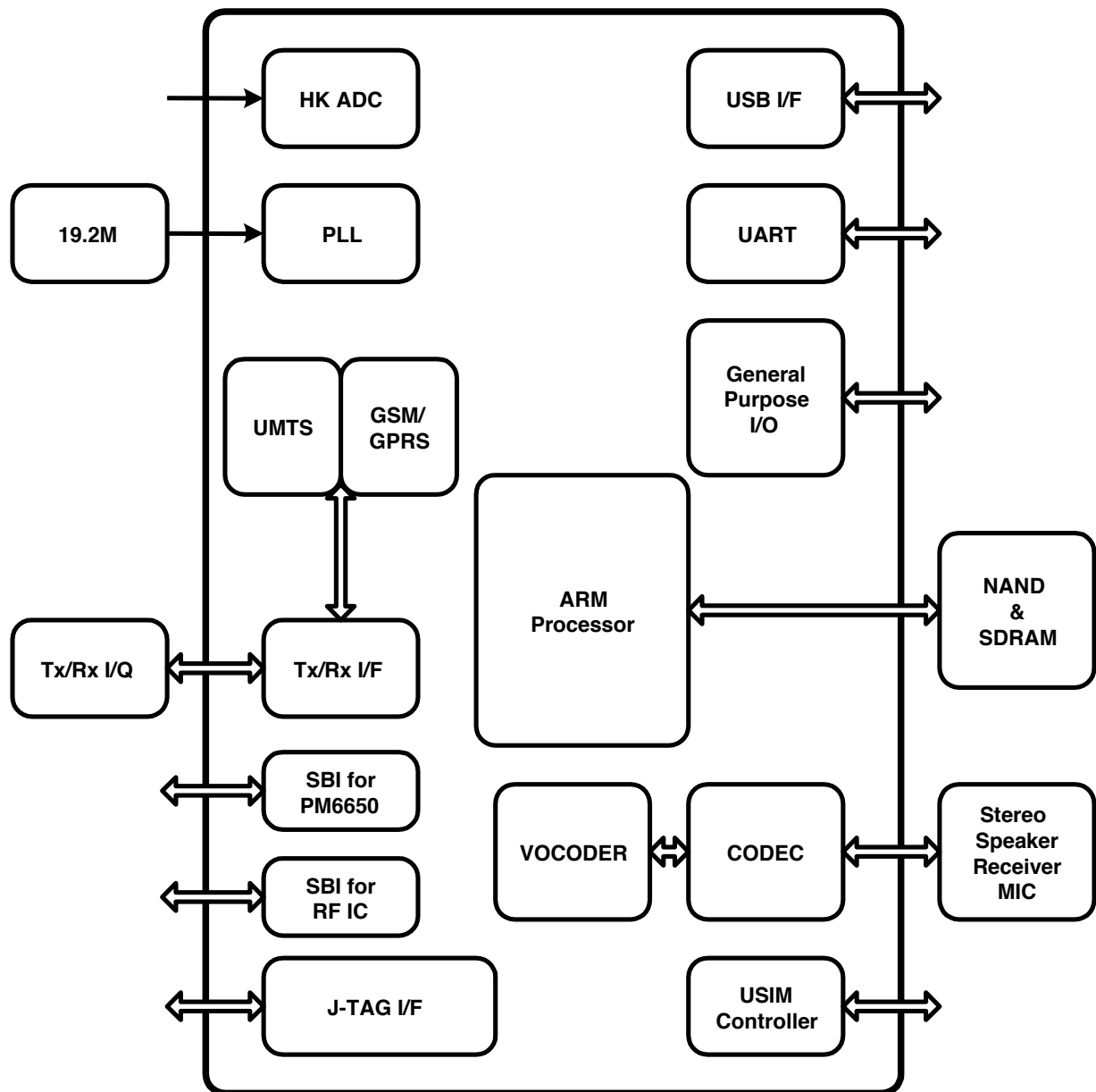


Figure. Simplified Block Diagram of MSM6250A

## 3. TECHNICAL BRIEF

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### 3.8. Subsystem(MSM6250A)

#### 3.8.1. ARM Microprocessor Subsystem

The MSM6250A device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM, including control of the external peripherals such as the keypad, LCD, RAM, and ROM devices. Through a QUALCOMM proprietary serial bus interface (SBI) the ARM926EJ-S configures and controls the functionality of the RTR6250, RFR6200, RFL6200, and PM6650-2M devices.

#### 3.8.2. UMTS Subsystem

The UMTS Subsystem performs the digital UMTS signal processing. Its components include:

- Searcher engine
- Demodulating fingers
- Combining block
- Frame deinterleaver
- Viterbi decoder
- Up-link subsystem
- Turbo decoder

On the down-link channel the UMTS subsystem searches, demodulates, and decodes incoming CPICH, CCPCH, SCH, and Traffic Channel information. It extracts packet data from the downlink traffic channel and prepares the packet data for processing. For the up-link, the CDMA subsystem processes the packet data and modulates the up-link traffic channel (DCH).

#### 3.8.3. GSM Subsystem

The GSM Subsystem performs the digital GSM signal processing.

#### 3.8.4. RF Interface

The RF interface communicates with the mobile station's external RF and analog baseband circuits. Signals to these circuits control signal gain in the Rx and Tx signal path and maintain The system's frequency reference.

#### 3.8.5. Serial Bus Interface(SBI)

The MSM6250A device's SBI is designed specifically to be a quick, low pin count control protocol for QUALCOMM's RTR6250, RFR6200, RFL6200, and PM6650 ASICs. Using the SBI, the RTR6250, RFR6200, RFL6200, and PM6650 devices can be configured for different operating modes and for minimum power consumption, extending battery life in Standby mode. The SBI also controls DC baseband offset errors.

### 3.8.6. Wideband CODEC

The MSM6250A device integrates a wideband voice/audio CODEC into the mobile station modem (MSM). The CODEC supports two differential microphone inputs, one differential earphone output, one single-ended earphone output, and a differential analog auxiliary interface on two single-ended earphone output. The CODEC integrates the microphone and earphone amplifiers into the MSM6250A device, reducing the external component count to just a few passive components. The microphone (Tx) audio path consists of a two-stage amplifier with the gain of the second stage set externally. The Rx/Tx paths are designed to meet the ITU-G.712 requirements for digital transmission systems.

### 3.8.7. Vocoder Subsystem

The MSM6250A device's QDSP4000 supports AMR vocoder. In addition, the QDSP4000 has modules to support the following audio functions: DTMF tone generation, DTMF tone detection, Tx/Rx volume controls, Tx/Rx automatic gain control (AGC), Rx Automatic Volume Control (AVC), EarSeal Echo Canceller (ESEC), Acoustic Echo Canceller (AEC), Noise Suppression (NS), and programmable, 13-tap, Type-I, FIR, Tx/Rx compensation filters. The MSM6250A device's integrated ARM7TDMI processor downloads the firmware into the QDSP4000 and configures QDSP4000 to support the desired functionality.

### 3.8.8. HKADC

The MSM6250A device has an on-chip 8-bit analog-to-digital converter (ADC) which is intended to digitize DC signals corresponding to analog parameters such as battery voltage, temperature, and RF power levels. The MSM6250A device has six analog input pins which are multiplexed to the input of the internal HKADC.

### 3.8.9. General-Purpose Input/Output Interface

The MSM6250A device has general-purpose bidirectional input/output pins. Some of the GPIO pins have alternate functions supported on them. The alternate functions include USB interface, additional RAM, ROM, general-purpose chip selects, parallel LCD interface, and UART interface.

## 3. TECHNICAL BRIEF

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### 3.8.10. UART

There are three UARTs in the MSM6250A ASIC:

- UART1 for data
- UART2 (can be used for USIM interface)
- UART3 (can be used for PM SBI interface)

### 3.8.11. USB

The MSM6250A device integrates a universal serial bus (USB) controller that supports both unidirectional and bidirectional transceiver interfaces. The USB controller acts as a USB function communicating with the USB host. The USB controller also supports digital audio through USB interface and connects directly to the QDSP4000 for the audio processing.

### 3.9. External memory interface

#### A. MSM6250A

The MSM6250A have two external memory interfaces with arbitration for the multi-layer AHB system and memory controllers. The EBI1 bus is a high performance bus that supports a wide variety of memories. EBI2 bus is targeted to be the interface for slow peripheral devices(i.e., LCD) as well as the NAND flash memory.

- EBI1 Features

- 16 bit static and dynamic memory interface
- 32 bit dynamic memory interface
- 24 bits of address for static memory devices which can support up to 32MBytes on each chip select
- Synchronous burst memories supported (burst NOR, burst PSRAM)
- Synchronous DRAM memories supported
- Byte addressable memory supporting 8 bit, 16 bit and 32 bit accesses
- Pseudo SRAM (PSRAM) memory support

- EBI2 Features

- Support for asynchronous FLASH and SRAM(16bit & 8bit).
- Interface support for byte addressable 16bit devices(UB\_N & LB\_N signals).
- 2Mbytes of memory per chip select.
- Support for 8 bit wide NAND flash.
- Support for parallel LCD interfaces, port mapped of memory mapped(16 & 8 bit)

- 512Mb NAND flash memory + 512Mb SDRAM

- 1-CS(Chip Select) are used

Interface Spec				
Device	Part Name	Maker	Read Access Time	Write Access Time
FLASH	TY90009800COGG	Toshiba	35 ns/Bytes	50 ns/Bytes
SDRAM	TY90009800COGG	Toshiba	107 ns/4Double Word	53 ns/4Double Word

**Table External memory interface for KU310**



### 3. TECHNICAL BRIEF

## 3.10. H/W Sub System

### 3.10.1. RF Interface

#### A. RTR6250D(WCDMA\_Tx, GSM\_Tx/Rx)

MSM6250A controls RF part(RTR6250) using these signals.

- SBST,SBDT,SBCK : SBI I/F signals for control Sub-chipset
- PAON : Power AMP on RF part
- RX\_I/Q,TX\_I/Q : I/Q for T/Rx of RF
- TX\_AGC\_ADJ : control the gain of the Tx signal prior to the power amplifier

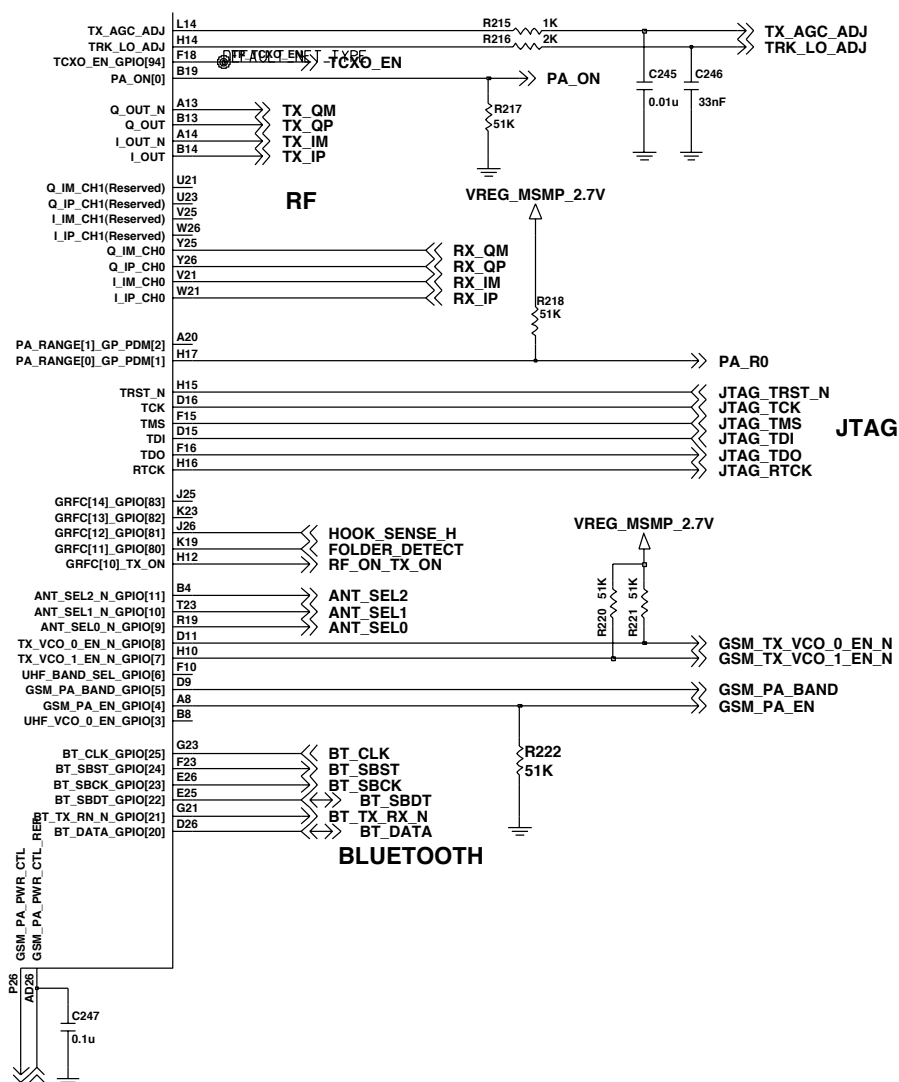


Figure. Schematic of RF Interface of MSM6250A

#### **B. RFR6250E(WCDMA\_Rx)**

- SBST,SBDDT,SBCK : SBI I/F signals for control Sub-chipset
- RX\_I/Q, : I/Q for Rx of RF

#### **C. the others**

- GSM\_PA\_BAND : DCS/GSM Band Selection of Power Amp
- TRK\_LO\_ADJ : TCXO(19.2M) Control
- PA\_ON : WCDMA TX Power Amp Enable
- ANT\_SEL[0-2] : Ant Switch Module Mode Selection(WCDMA,GSM Tx/Rx,DCS Tx/Rx)
- GSM\_PA\_RAMP : Power Amp Gain Control of APC\_IC
- GSM\_PA\_EN : Power Amp Gain Control Enable of APC\_IC
- GSM\_TX\_VCO\_0\_EN\_N : GSM Band Tx VCO Enable of Dual VCO
- GSM\_TX\_VCO\_1\_EN\_N : DCS Band Tx VCO Enable of Dual VCO

### 3. TECHNICAL BRIEF

#### 3.10.2. MSM Sub System

##### 3.10.2.1. SIM Interface

SIM interface scheme is shown in Figure.

And, there control signals are followed

- USIM\_CLK : USIM Clock
- USIM\_Reset : USIM Reset
- USIM\_Data : USIM Data T/Rx

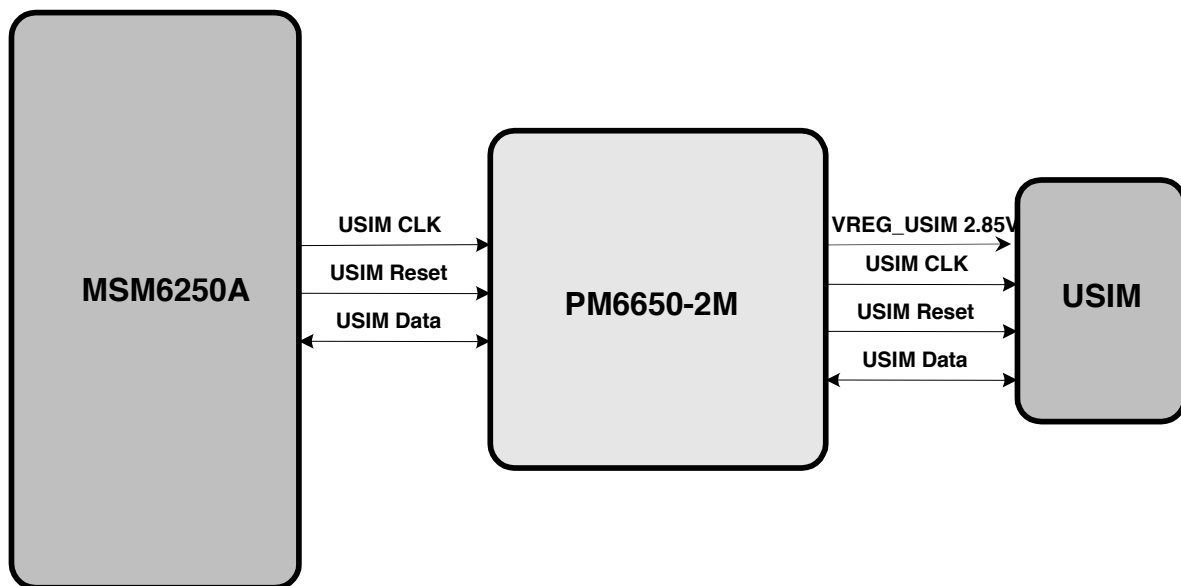


Figure. SIM Interface

##### 3.10.2.2. UART Interface

UART signals are connected to MSM GPIO through IO connector with 115,200 bps speed.

And, used for RF calibration and Data download.

GPIO_Map	Name	Note
GPIO_96	UART_RXD	Data_Rx
GPIO_95	UART_TXD	Data_Tx

Table. UART Interface

efficient interconnect between the mobile phone and a personal computer (PC). The USB interface of the MSM6250A was designed to comply with the definition of a peripheral as specified in USB Specification, Revision 1.1. Therefore, by definition, the USB interface is also compliant as a peripheral with the USB Specification, Revision 2.0. The USB Specification Revision 1.1 defines two speeds of operation, namely low-speed (1.5 Mbps) and full-speed (12 Mbps), both of which are supported by the MSM6250A. U880's USB interface uses the PM6650-2M internal logic for USB Transceiver.

### Table. USB Signal Interface



### 3. TECHNICAL BRIEF

#### 3.10.2.4. HKADC(House Keeping ADC)

The MSM6250A device has an on-chip 8-bit analog-to-digital converter (HKADC) which is tended to digitize DC signals corresponding to analog parameters such as battery voltage, temperature, and RF power levels. The MSM6250A device has six analog input pins which are multiplexed to the input of the internal HKADC.

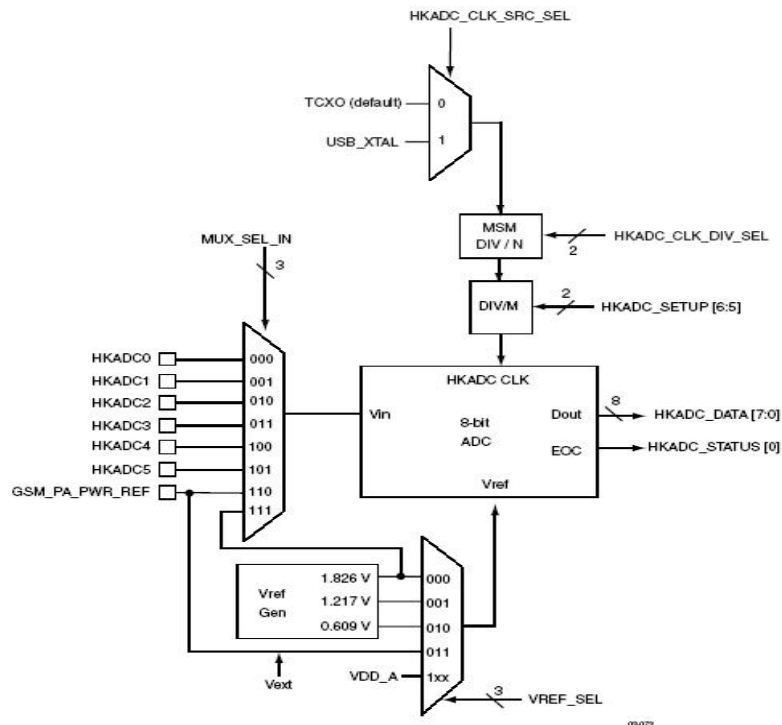


Figure. MSM6250A HKADC Block diagram

ADC Ch#	Signal Name	Note
HKADC0	AMUX_OUT	RF PAM Temperature sensing
HKADC1	VBATT_SENSE	Battery voltage level sensing
HKADC2	HDET1	RF WCDMA PAM Power Level sensing
HKADC3		
HKADC4	PCB REVISION	MAIN PCB Revision checking
HKADC5	VBAT_TEMP	Battery Temperature sensing

Table. HKADC channel table

### 3.10.3. Power Block

#### 3.10.3.1. General

MSM6250A, included RF, is fully covered by PM6650-2M(Qualcomm PMIC). PM6650-2M cover the power of MSM6250A, MSM memory, RF block, Bluetooth, Trans flash, USIM and TCXO.

Major power components are :

PM6650-2M(U400) : Phone power supply

BH28FB1WHFV(U505) : LCD Power supply

QST4(Q400,Q401) : External charger supply switching

SI3493DV(Q402) : Main Battery charging control

R1114D281D(U502/U504) : Camera power supply

#### 3.10.3.2. PM6650-2M

The PM6650-2M device (Figure 1-1) integrates all wireless handset power management. The power management portion accepts power from all the most common sources - battery, external charger, adapter, coin cell back-up - and generates all the regulated voltages needed to power the appropriate handset electronics. It monitors and controls the power sources, detecting which sources are applied, verifying that they are within acceptable operational limits, and coordinates battery and coin cell recharging while maintaining the handset electronics supply voltages. Eight programmable output voltages are generated using low dropout voltage regulators, all derived from a common trimmed voltage reference.

A dedicated controller manages the TCXO warm-up and signal buffering, and key parameters (under-voltage lockout and crystal oscillator signal presence) are monitored to protect against detrimental conditions.

MSM device controls and statuses the PM6650-2M IC using a three-line Serial Bus Interface (SBI) supplemented by an Interrupt Manager for time-critical information. Another dedicated IC Interface circuit monitors multiple trigger events and controls the power-on sequence.

### 3. TECHNICAL BRIEF

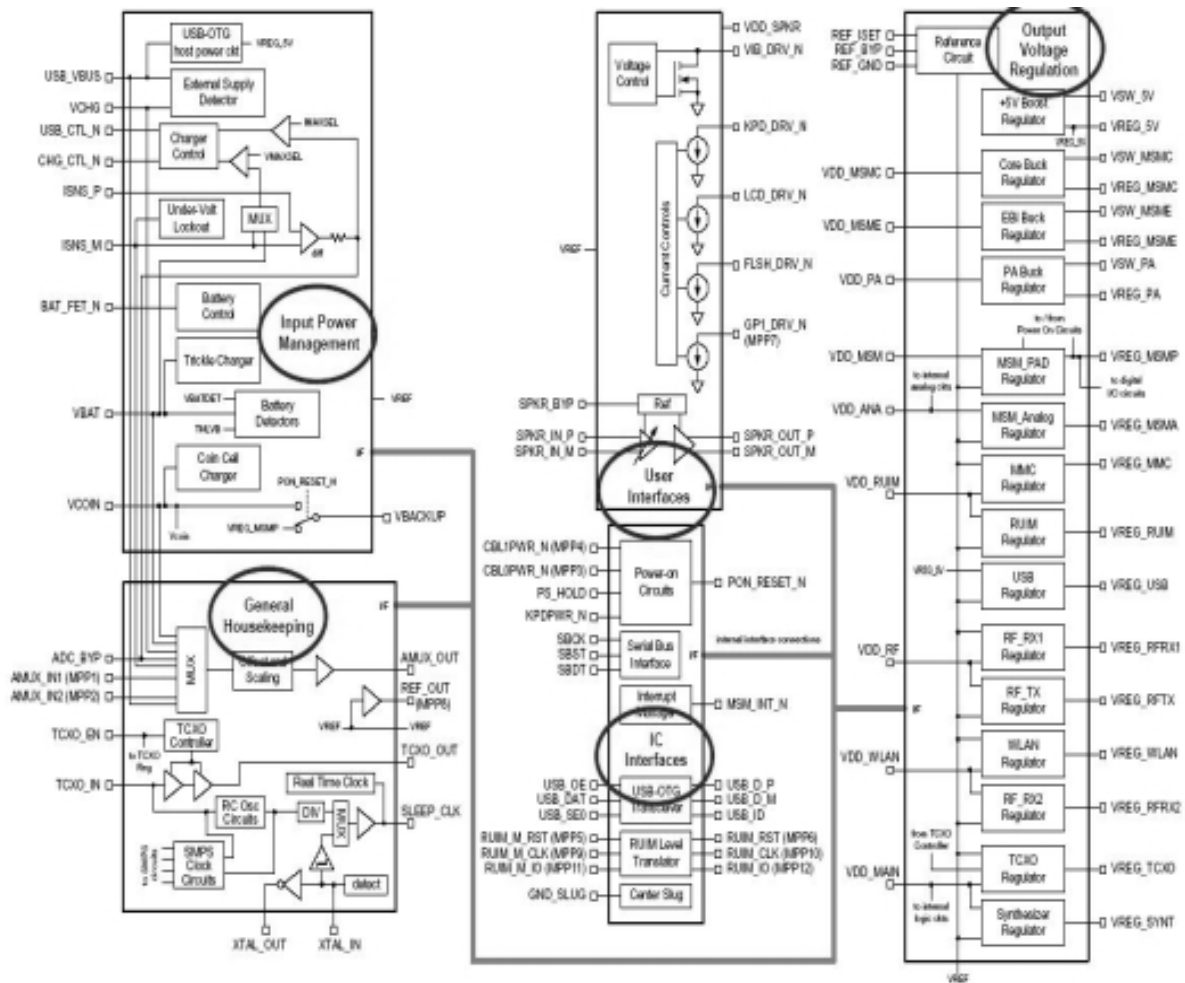
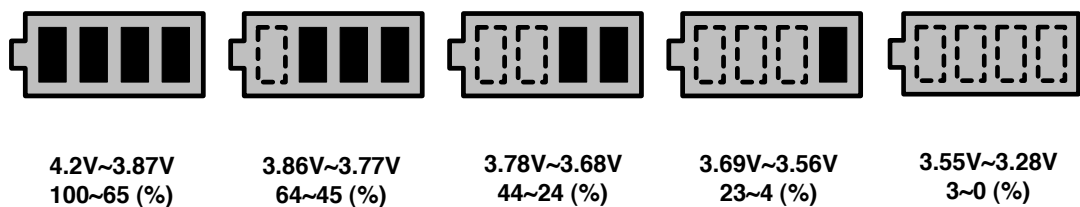


Figure. PM6650-2M Functional Block Diagram

A programmable charging block in PM6650-2M is used for battery charging. It is possible to set limits for the charging current. The external supply typically connects directly to pin (VCHG). The voltage on this pin (VCHG) is monitored by detection circuitry to ascertain whether a valid external supply is applied or not. For additional accuracy or to capture variations over time, this voltage is routed internally to the housekeeping ADC via the analog multiplexer. PM6650-2M circuits monitor voltages at VCHARGER and ICHARGE pins to determine which supply should be used and when to switch between the two supplies. These pins are connected to the Source (or emitter) and Drain (or collector) contacts of the pass transistor respectively.



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Only for training and service purposes

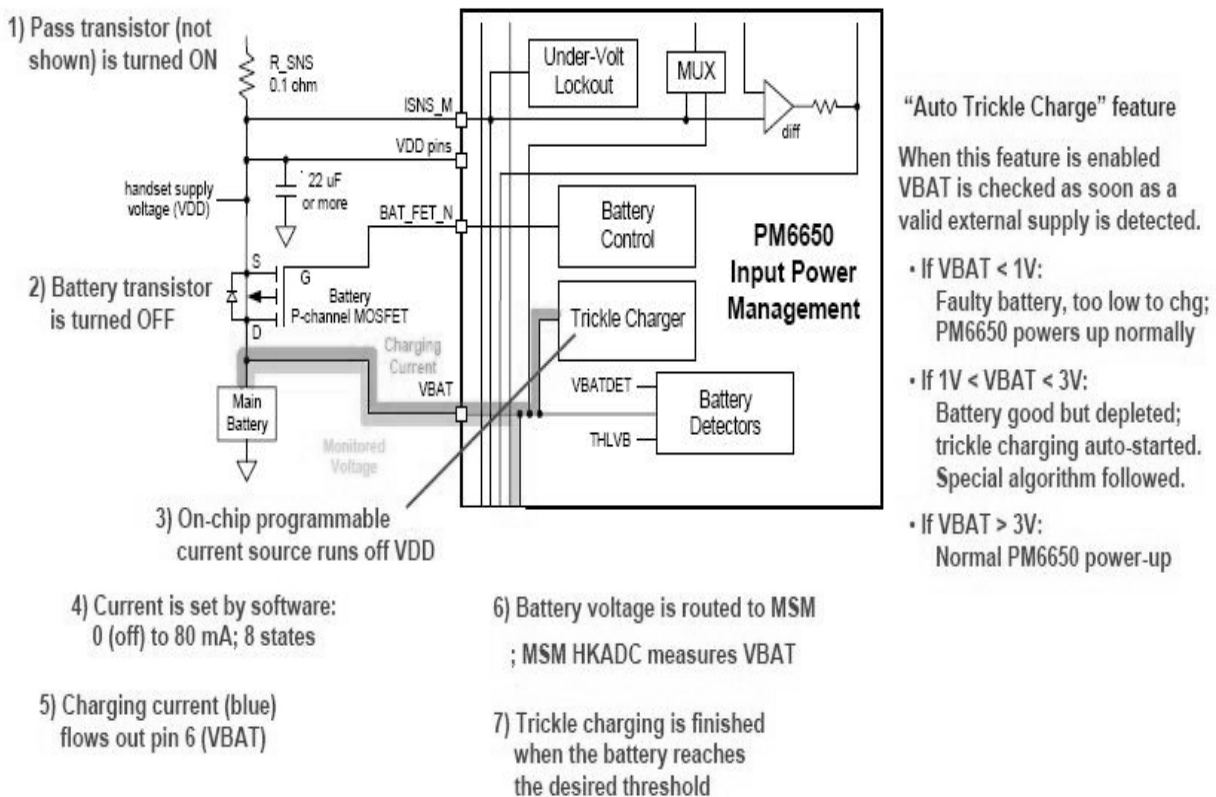


### 3. TECHNICAL BRIEF

#### 3.10.3.3.1. Trickle Charging

Trickle Charging of the main battery, enabled through SBI control and powered from  $V_{DD}$ , is provided by the PM6650 IC. The trickle charger is on-chip programmable current source that supplies current from  $V_{DD}$  to pin (VBAT). Trickle charging can be used for lithium-ion and nickel-based batteries, with its performance specified below (3.2V). The charging current is set to 80mA.

Parameter	Min	Typ	Max	Unit
Trickle Current	60	80	100	mA



### 3.10.3.3.2. Constant Current Charging

The PM6650 IC supports constant current charging of the main battery by controlling the charger pass transistor and the battery transistor. The constant current charging continues until the battery reaches its target voltage, 4.2V.

### 3.10.3.3.3. Constant Voltage Charging

Constant voltage charging begins when the battery voltage reaches a target voltage, 4.2V.

The end of constant voltage charging is commonly detected 10% of the full charging current (60mA)

- Charging Method : CC & CV (Constant Current & Constant Voltage)
- Maximum Charging Voltage : 4.2V
- Maximum Charging Current : 600mA
- Battery Capacity : 800 mAh
- Charger Voltage : 4.8V
- Charging time : Max 2.5h (Except time trickle charging)
- Full charge indication current (icon stop current) : 60mA
- Low battery POP UP : Idle - 3.45V, Dedicated(GSM/WCDMA) - 3.47V
- Low battery alarm interval : Idle - 3 min, Dedicated - 1min
- Cut-off voltage : 3.20V

### 3. TECHNICAL BRIEF

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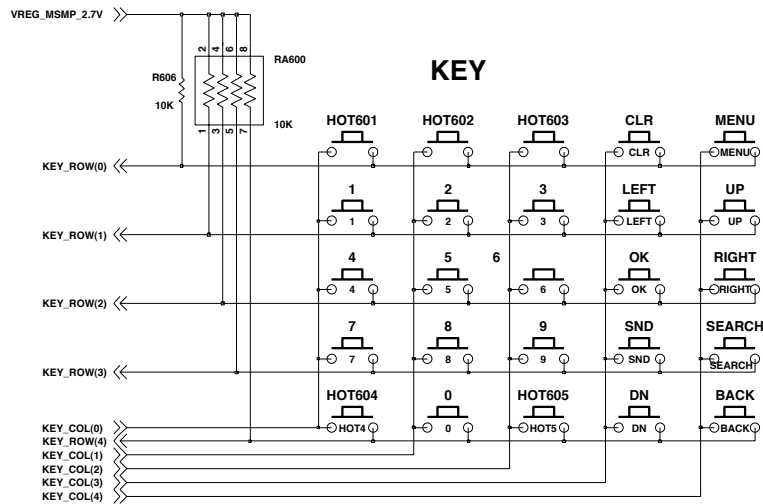
#### 3.10.4. Key Pad

There are 26 buttons and 3 side keys in Figure. Shows the Keypad circuit. 'END' Key is connected On\_SW to PMIC(PM6650-2M) and MSM(GPIO76).

	COL0	COL1	COL2	COL3	COL4	COL5
ROW0	HOT1 (VT)	HOT2 (H3G)	HOT3 (MENU)	CLR (Clear)	FUNC_1	Side key (camera)
ROW1	1	2	3	LEFT	UP	Side key (Down)
ROW2	4	5	6	OK	RIGHT	Side Key (Up)
ROW3	7	8	9	SEND	FUNC_2	
ROW4	HOT4 (*)	0	HOT5(#)	DN	BACK	

**Table Key Matrix Mapping Table**

### 3. TECHNICAL BRIEF



### SIDE\_KEY

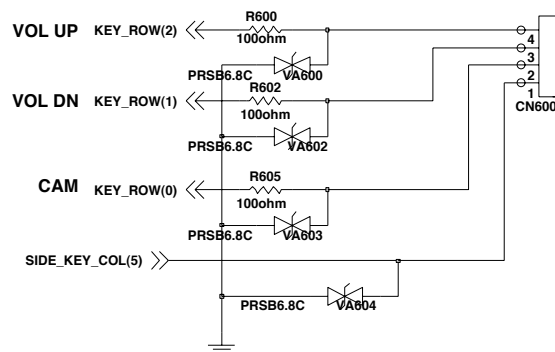


Figure Keypad Circuit

### 3. TECHNICAL BRIEF

#### 3.10.5 Camera Interface

KU310 Installed a 1.3M Pixel CMOS VGA Camera.

Below figure show the camera board to board connector and camera I/F signal.

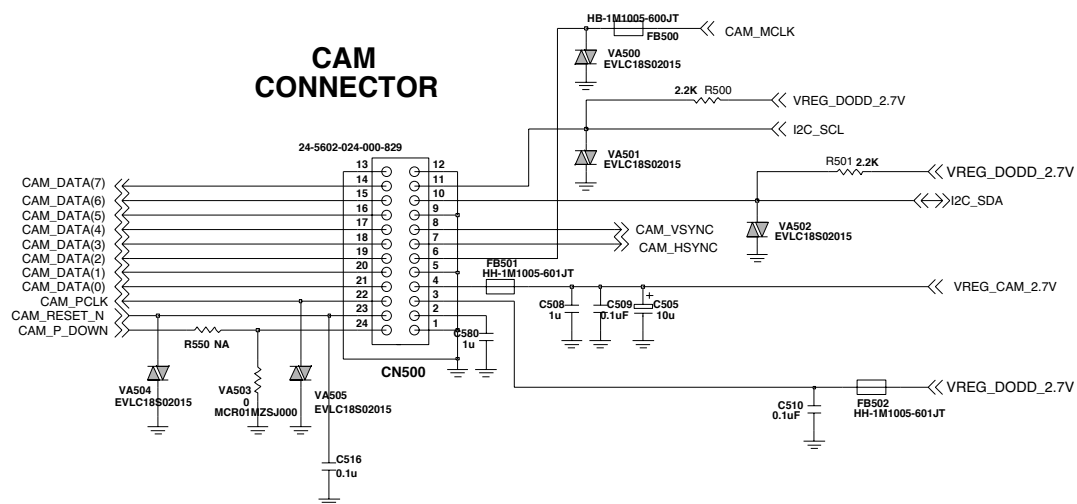


Figure Camera Board to Board Connector

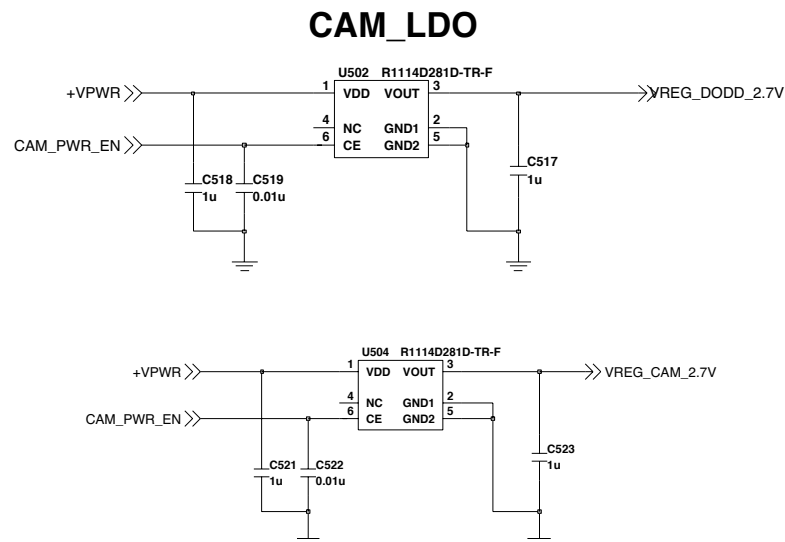


Figure Camera LDO(2.7V/2.7V)

### 3. TECHNICAL BRIEF

The Camera module is connected to main board with 24pin Board to Board connector (AXK7L24227). Its interface is dedicated camera interface port in MSM6250A. The camera port supply 24MHz master clock to camera module and receive 12MHz pixel clock (30fps), vertical sync signal, horizontal sync signal, reset signal and 8bits data from camera module. The camera module is controlled by I2C port from MSM6250A.

No	Name	Port	Note
1	GND	GND	GND
2	-	-	Camera Digital Power
3	VREG_DODD_2.7V	I	Camera Analog, I/O Power
4	VREG_CAM_2.7V	I	Camera Analog, I/O Power
5	GND	GND	GND
6	CAM_MCLK	I	Master Clock(24M)
7	CAM_HSYNC	O	Horizontal Sync
8	CAM_VSYNC	O	Vertical Synch
9	GND	GND	GND
10	I2C_SDA	I/O	I2C command
11	I2C_SCL	I	I2C Clock
12	GND	GND	GND
13	GND	GND	GND
14	CAM_DATA(7)	O	Data
15	CAM_DATA(6)	O	Data
16	CAM_DATA(5)	O	Data
17	CAM_DATA(4)	O	Data
18	CAM_DATA(3)	O	Data
19	CAM_DATA(2)	O	Data
20	CAM_DATA(1)	O	Data
21	CAM_DATA(0)	O	Data
22	CAM_PCLK	O	Clock for Camera Data Out
23	CAM_RESET_N	I	Camera reset signal
24	CAM_P_DOWN	I	Camera power down enable

**Table. Interface between Camera Module and Main Board (in camera module)**

### 3. TECHNICAL BRIEF

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#### 3.11.6 Folder ON/OFF Operation

There is a magnet to detect the folder status, opened or closed.

If a magnet is close to the hall-effect switch, the voltage at pin1 of U600 goes to 0V. Otherwise, 2.6V.

This folder signal is delivered to MSM6275 GPIO43.

## FOLDER\_SENSE

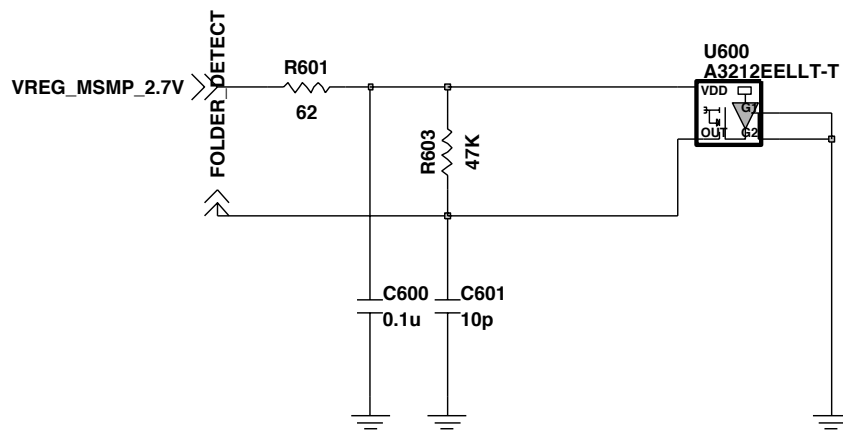


Figure. Schematic of Folder ON/OFF detection circuit

### 3.10.7. Camera Direction Detection

CAM\_SENSE detects the Camera Direction (front or back)

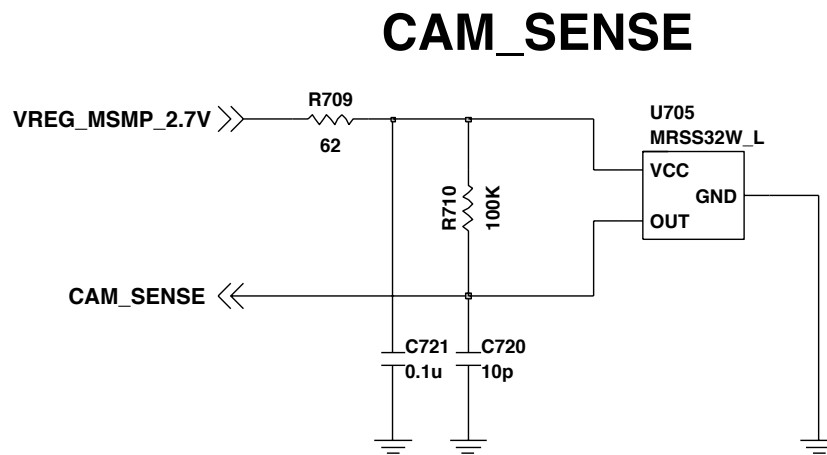


Figure Camera Direction Detection

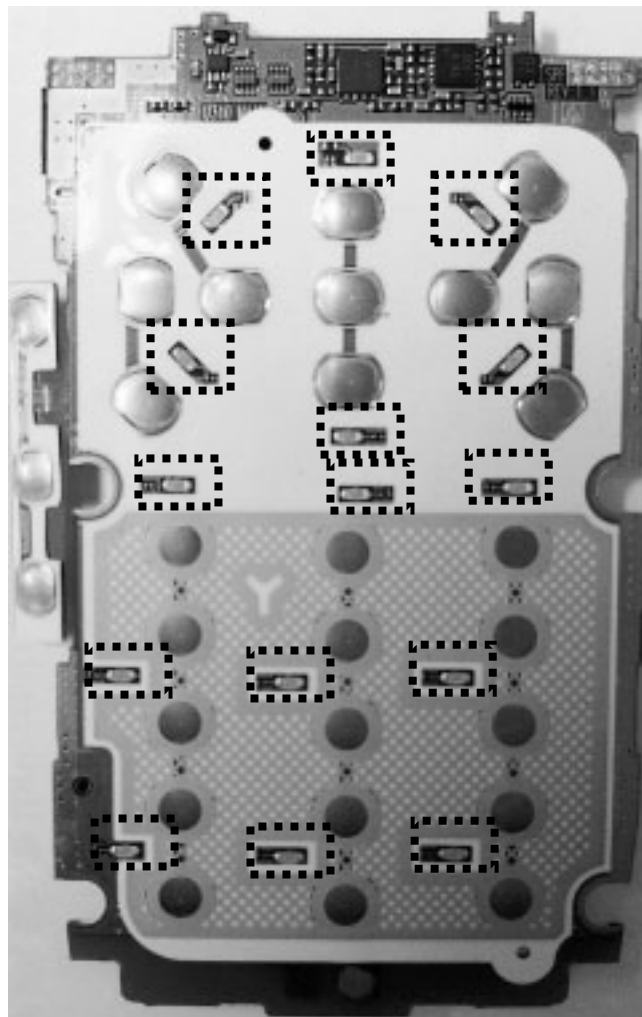


### 3. TECHNICAL BRIEF

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#### 3.10.8. Keypad Light

There is Backlight LED on Top side in board backlight circuit, which is driven by KYPD\_BACKLIGHT line from PM6650-2M. Key Pad backlight controlled by PM6650-2M.



**Figure. Backlight LED**

### 3.10.9. LCD Module

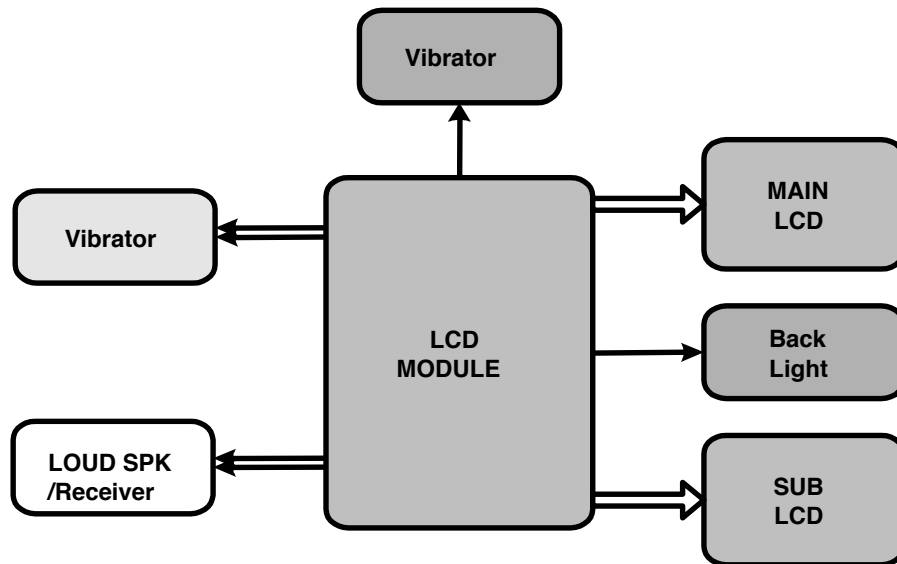


Figure. LCD Module Block Diagram

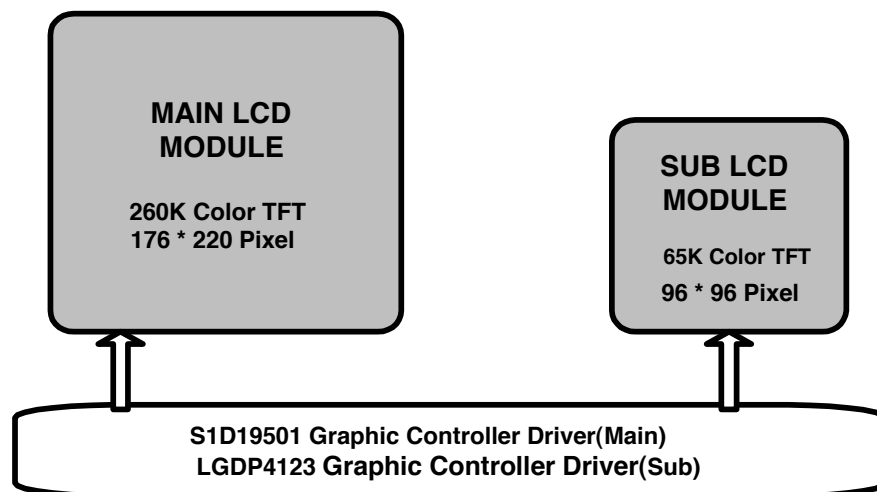


Figure. LCD Module(Main & Sub LCD)  
(note, one Driver IC control both Main and Sub LCD).

### 3. TECHNICAL BRIEF

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#### 3.10.10.1. Display & LCD FPC Interface

LCD module is connected to Main board with 50-pin BtoB connector (CN600\_AXT450164) and Speaker, Receiver, Vibrator are connected by soldering the leads to pads in LCD FPCB module. The LCD is controlled by 16-bit EBI2 in MSM6250

1 : NC	26 : GND
2 : VREG_LCD_2.8V : LCD Power	27 : GND
3 : VREG_LCD_2.8V : LCD Power	28 : GND
4 : GND	29 : WLED_3 : LCD Back light control
5 : DATA(0)	30 : WLED_2 : LCD Back light control
6 : DATA(1)	31 : WLED_1 : LCD Back light control
7 : DATA(2)	32 : MOTOR_PWR- : MOTOR control
8 : DATA(3)	33 : OLED_CS_N
9 : DATA(4)	34 : GND
10 : DATA(5)	35 : GND
11 : DATA(6)	36 : DATA(15)
12 : DATA(7)	37 : DATA(14)
13 : LCD MAKER ID	38 : DATA(13)
14 : GND	39 : DATA(12)
15 : +VPWR : Vibrator Power	40 : DATA(11)
16 : OLED_EN	41 : DATA(10)
17 : KEY_COL(6) : MOD KEY	42 : DATA(9)
18 : WLED_PWR : LCD Back light power	43 : DATA(8)
19 : WLED_PWR : LCD Back light power	44 : OE_N : Read_Enable
20 : GND	45 : WE_N : Write_Enable
21 : SPK- : Loud speaker	46 : GND
22 : SPK+ : Loud speaker	47 : ADS : Address strobe
23 : KEY_ROW(1) : MOD KEY	48 : LCD_CS_N : Chip select
24 : KEY_ROW(2) : MOD KEY	49 : LCD_RESET_N
25 : KEY_ROW(3) : MOD KEY	50 : LCD_IF_MODE : LCD Data interface control

#### 3.10.11. Audio and Sound

##### 3.10.11.1. Overview of Audio & Sound path

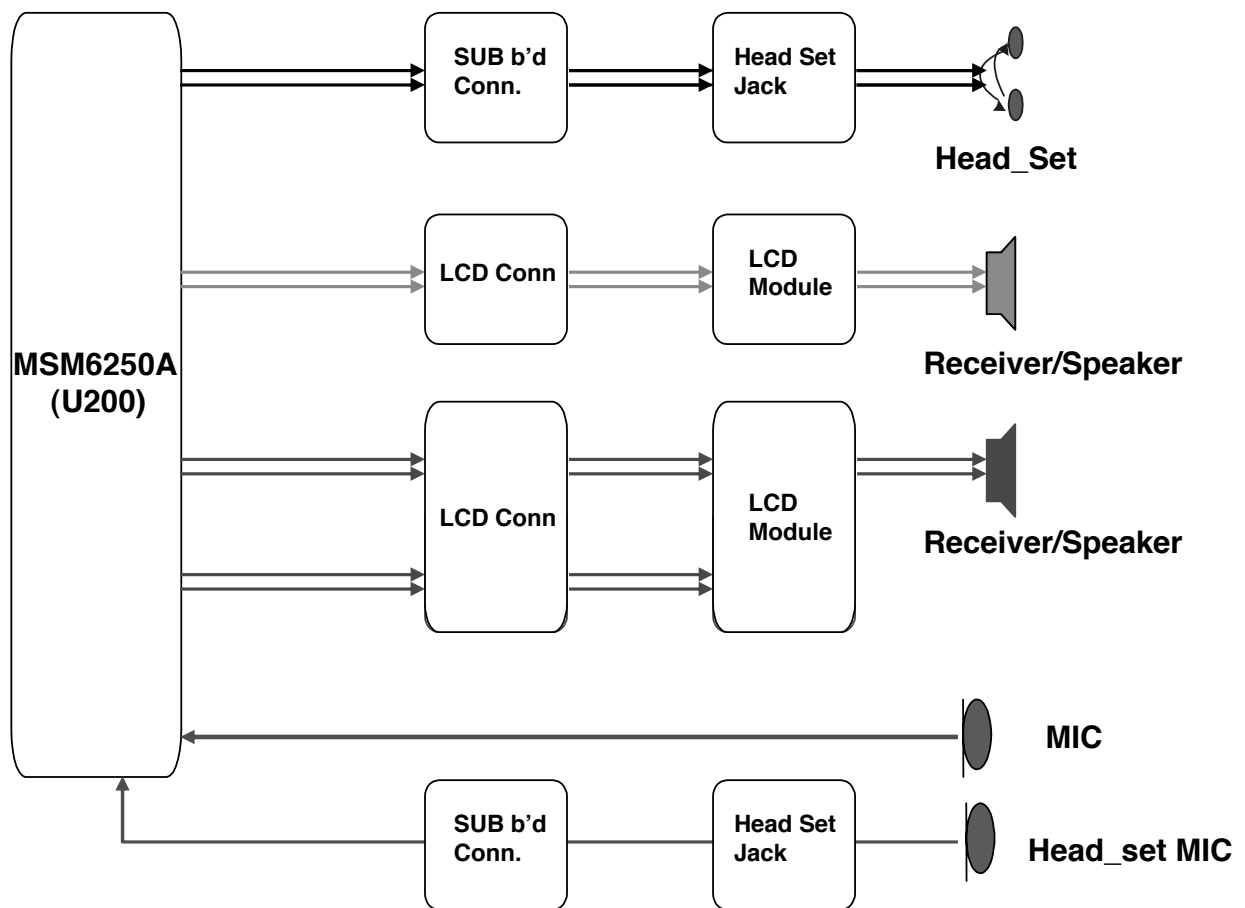


Figure Audio & Sound Path Block Diagram

### 3. TECHNICAL BRIEF

### 3.10.11.2. Audio Signal Processing & Interface

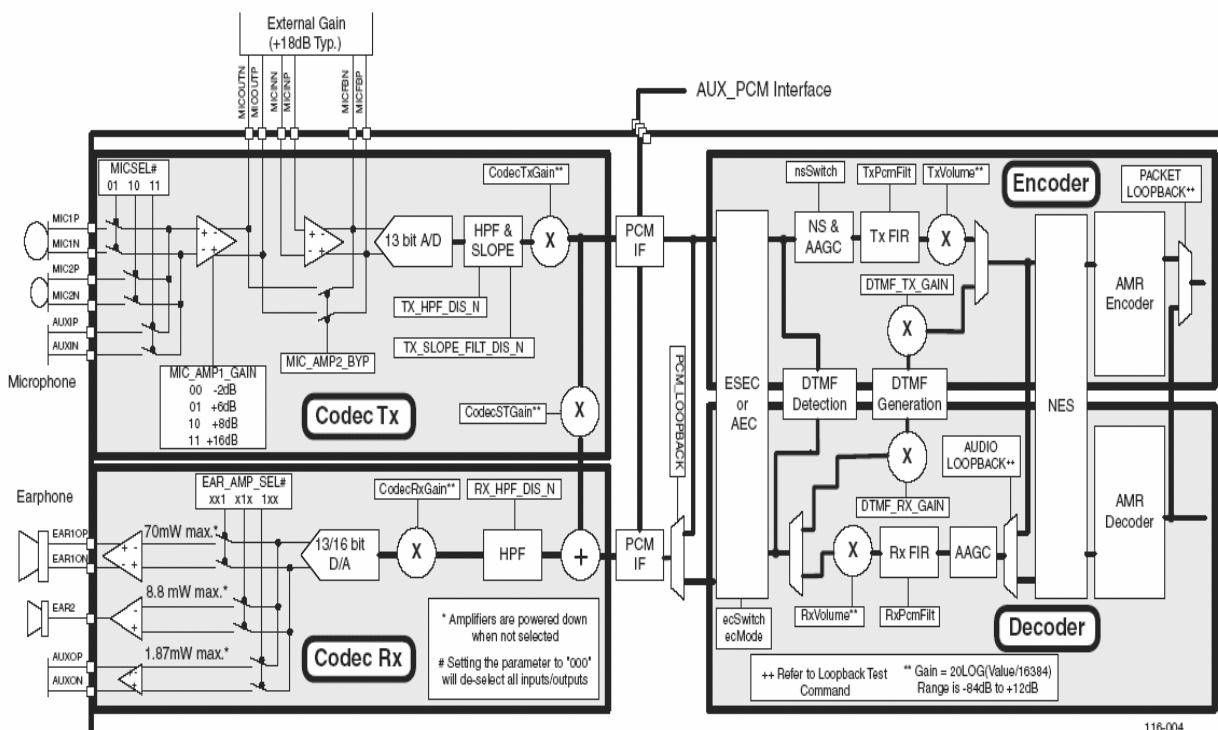
Audio signal processing is divided Uplink path and downlink path.

The uplink path amplifies the audio signal from MIC and converts this analog signal to digital signal and then transmit it to DBB Chip (MSM6250A). This transmitted signal is reformed to fit in GSM & WCDMA Frame format and delivered to RF Chip. The downlink path amplifies the signal from DBB chip (MSM6250A) and outputs it to Receiver (or Speaker).

The receive path can be directed to either one of two earphone amplifiers or the auxiliary output.

The outputs earphone1 (EAR1OP, EAR1ON) and Auxiliary out (AUXOP, AUXON) are differential outputs. Earphone2 (EAR2O) is a single-ended output stage designed to drive a headset speaker.

The microphone interface consists of two differential microphone inputs, one differential auxiliary input and a two-stage audio amplifier.

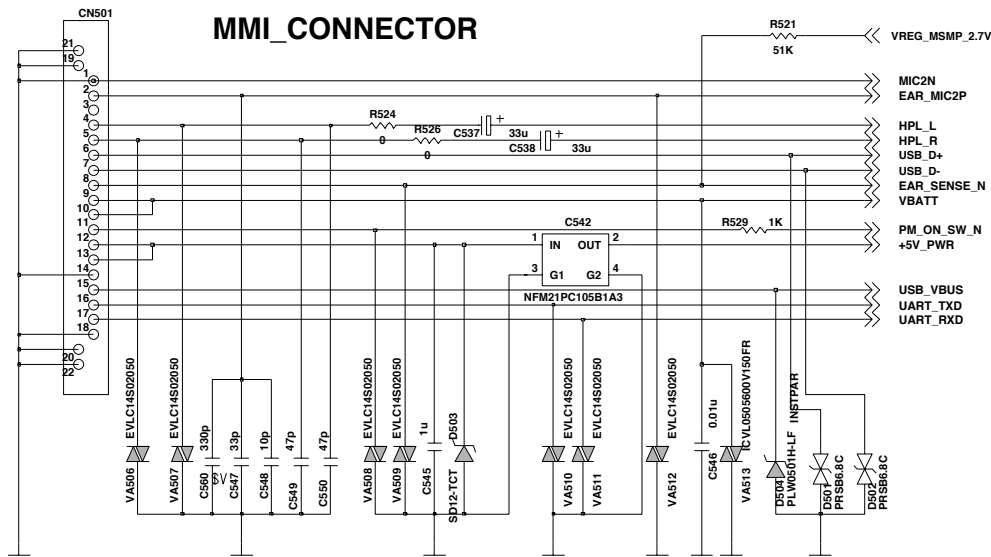


### Figure Audio Interface Detailed Diagram(MSM6250A)

## MSM6250A BLK

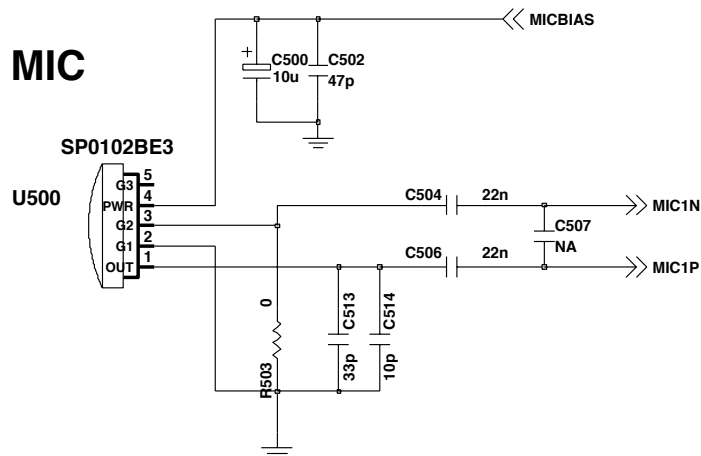
## MIC\_Feedback

## Near to MSM

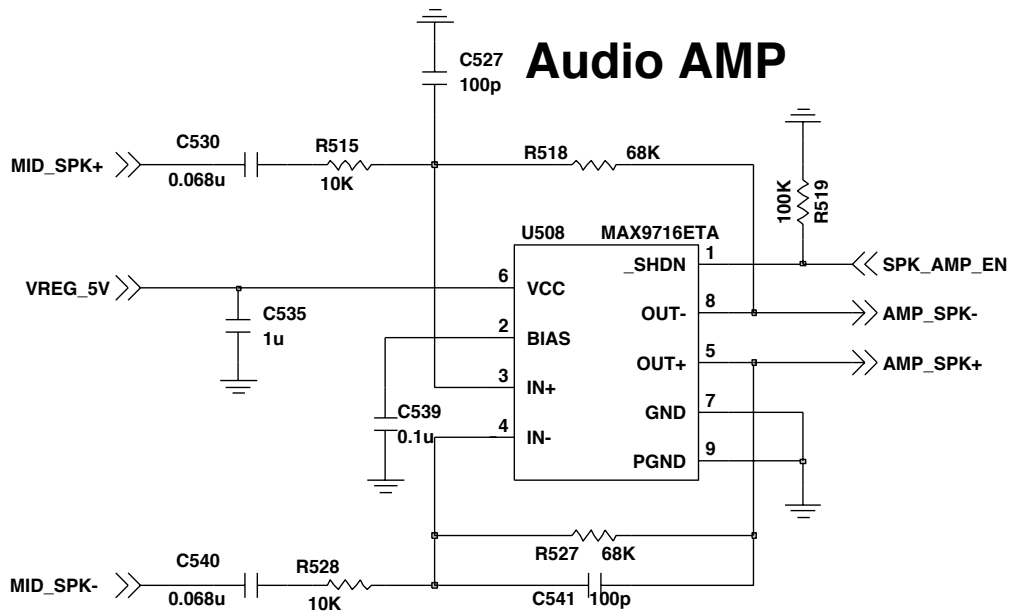


### 3. TECHNICAL BRIEF

#### Handset main MIC BLK

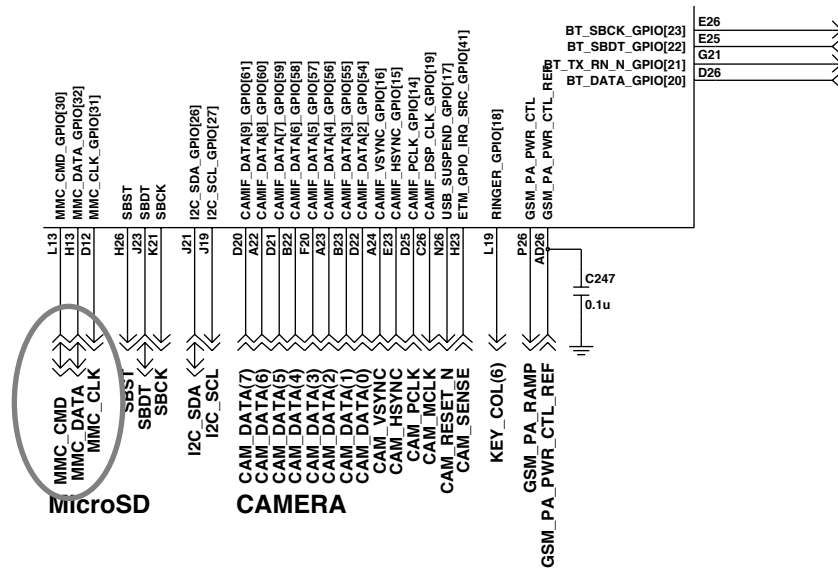


#### Audio Amp for loud Speaker



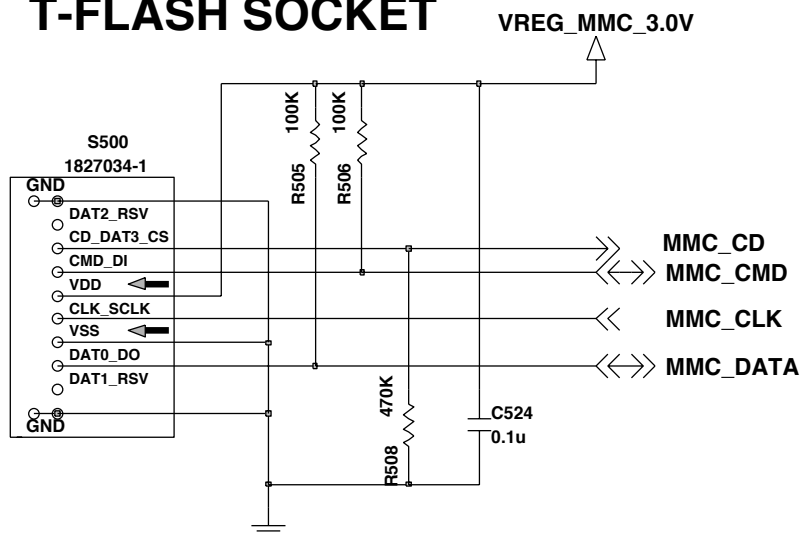
## 3.10.12. Trans Flash

### MSM6250 BLK



### Trans Flash BLK

## T-FLASH SOCKET





### 3. TECHNICAL BRIEF

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#### 3.11 LG-KU310 Main features

##### 1. LG-KU310 Main features

- Folder Type
- WCDMA(2100) + GSM(900,1800) + PCS(1900) Triple mode
- Dual color LCD(Main:260K TFT, Sub:65K OLED)
- 1.3M Pixel CMOS VGA Camera
- 17 pi Stereo speaker
- Stereo Head\_set
- Video telephony in WCDMA with camera
- Loud Speaker phone(in GSM and WCDMA)
- 72 Poly Sound
- MP3/AAC/WMA decoder and play
- MPEG4 encoder/decoder and play/save
- JPEG en/decoder
- Support Bluetooth, USB
- 93.7 X 49 X 18.6 mm
- 800mAh(Lithium-ion Polymer Battery)

## 2. LG-KU310 Main Components



**MAIN Bottom Side**



**MAIN Top Side**



**SUB Top Side**



**SUB Bottom Side**



**1.3M Camera Module**



**Stereo Headset**



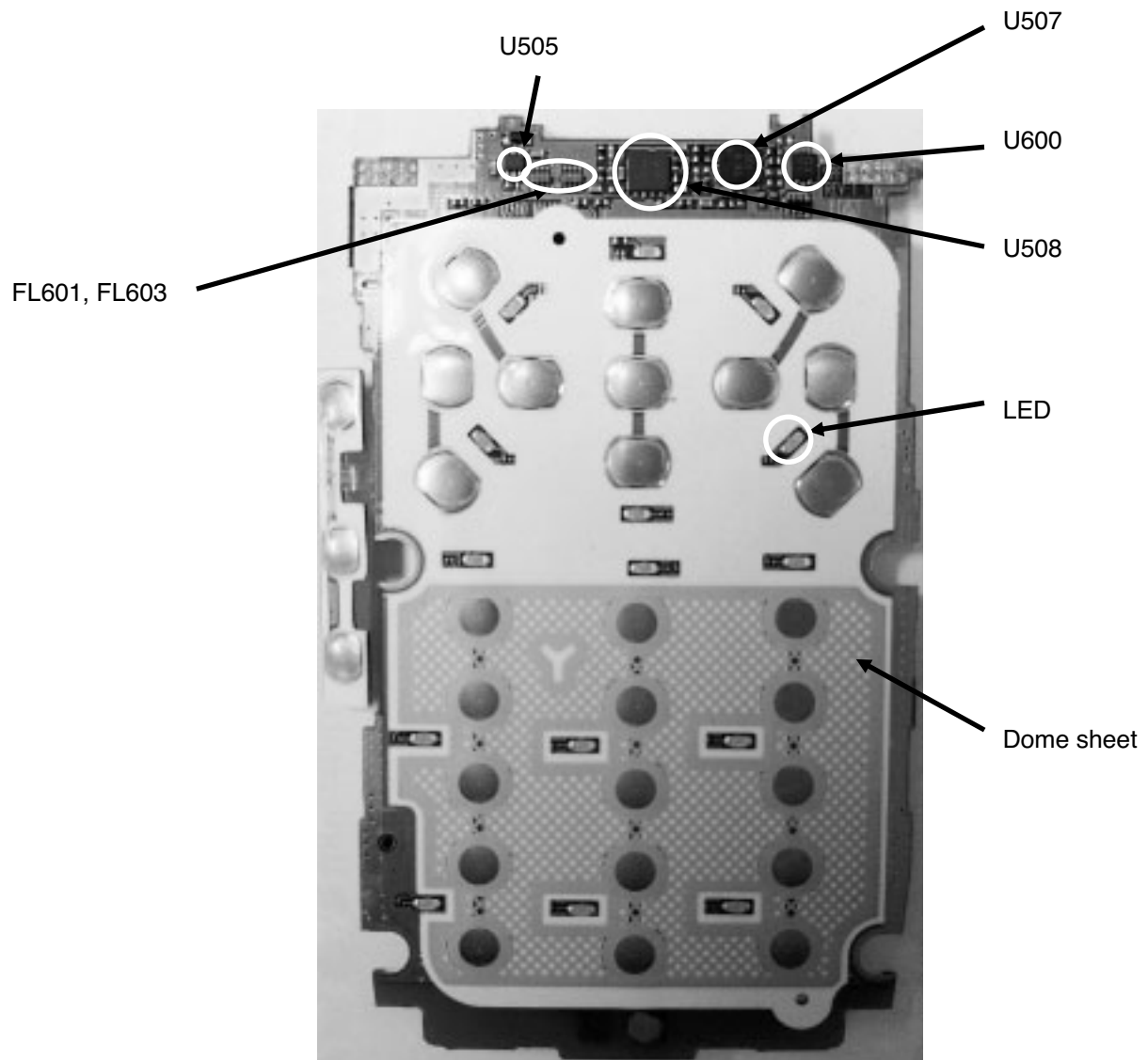
**KU310**



**LCD & Folder Assy**

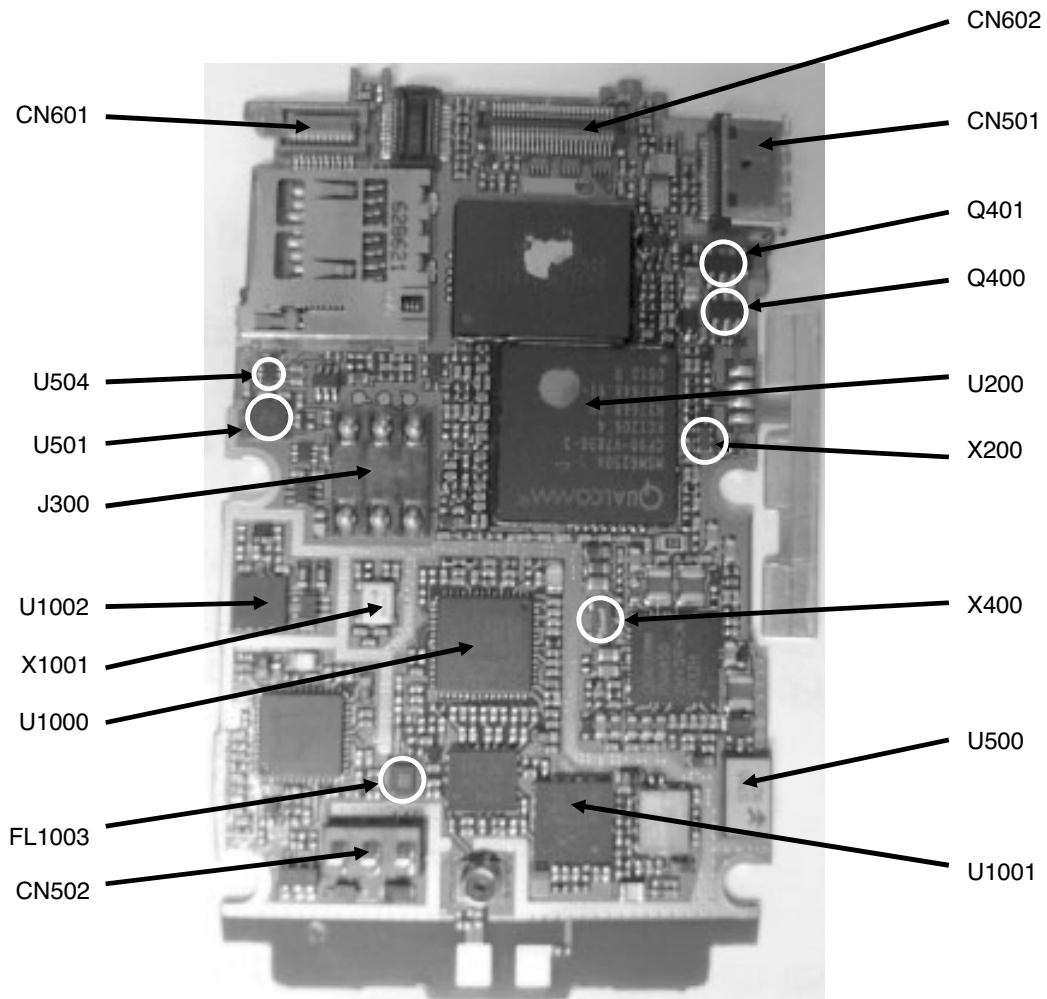
### 3. TECHNICAL BRIEF

#### 2-3. SUB Bottom Side



Reference	Description	Reference	Description
U505	LCD 2.8V LDO	U508	Audio AMP
U507	Audio Analog Switch	U600	Folder detect sensor
FL601, FL603	LCD EMI Filter		

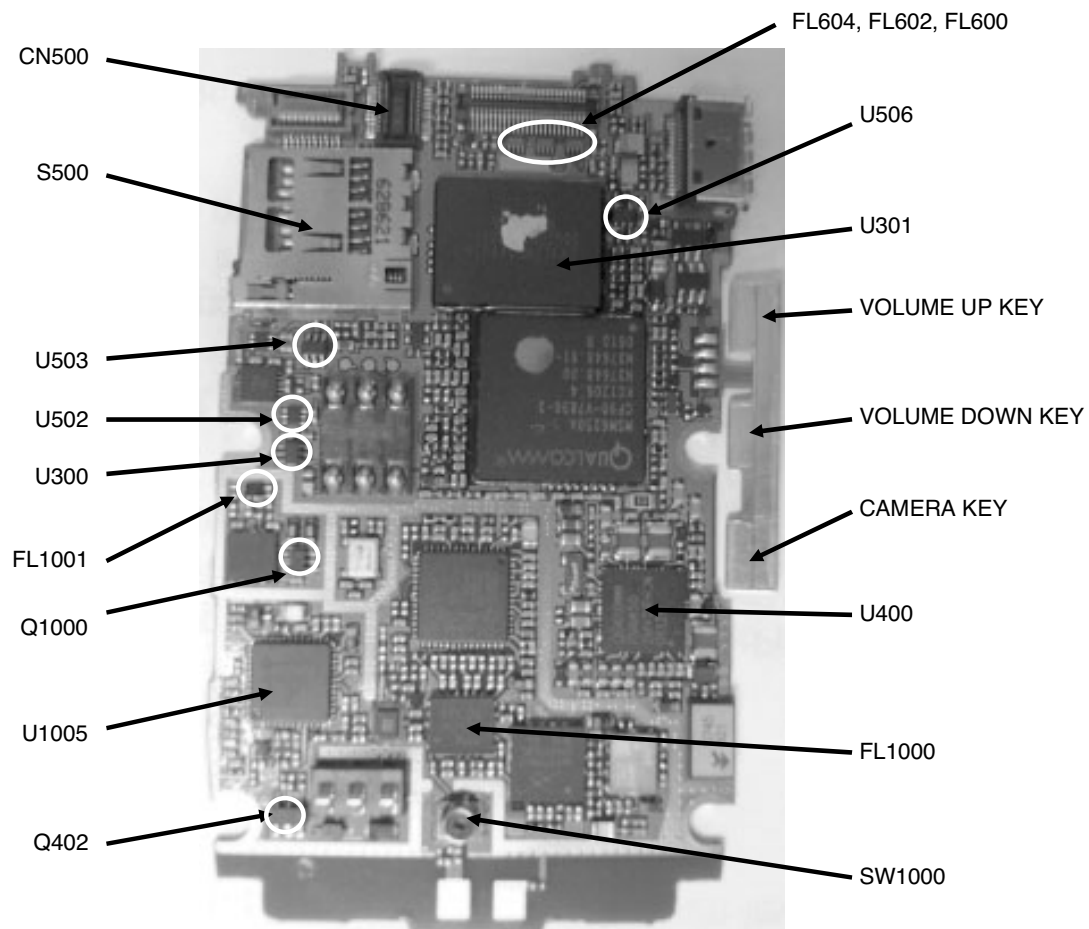
#### 2-2. Main Bottom Side



Reference	Description	Reference	Description
CN601	20pin sub board connector	CN602	LCD 50pin connector
U504	Camera 2.7V LDO	CN501	18pin MMI connector
U501	LCD back light charge pump	Q401	Charging TR
J300	SIM connector	Q400	USB Charging TR
U1002	WCDMA PAM	U200	MSM6250A
X1001	VTCXO	X200	USB 48M CLOCK
U1000	RTR6250	X400	XTAL(32.768KHz)
FL1003	WCDMA Duplexer	U500	MIC
CN502	BATTERY CONNECTOR	U1001	GSM PAM

### 3. TECHNICAL BRIEF

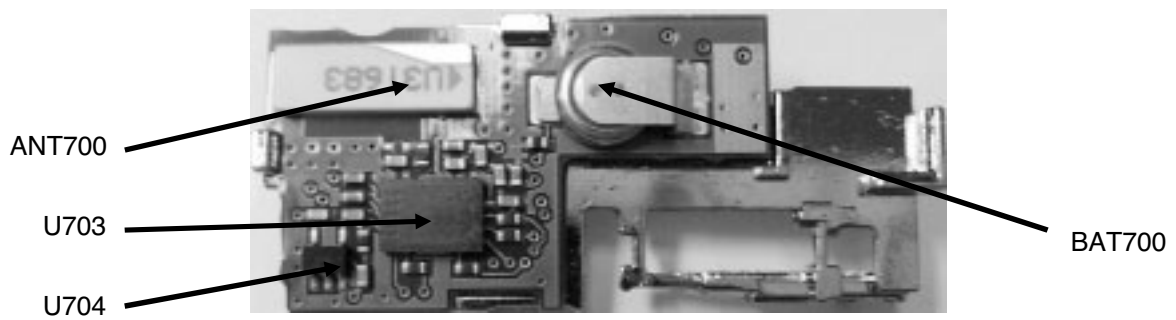
#### 2-2. Main Bottom Side(continued)



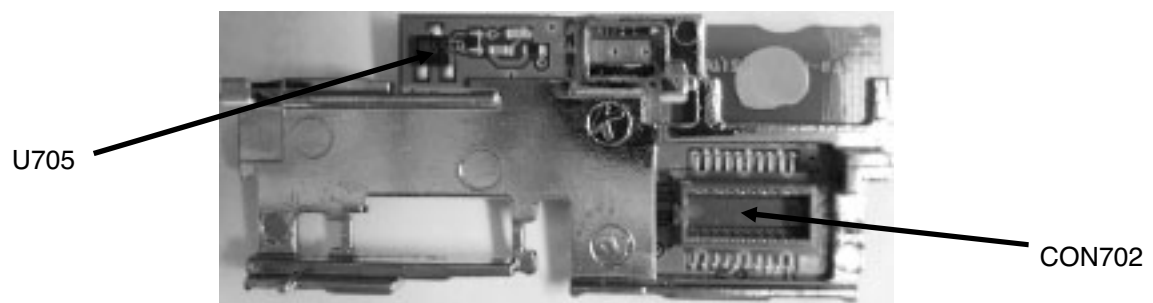
Reference	Description	Reference	Description
CN500	Camera connector	FL604	EMI Filter
S500	Micro SD card socket	FL602	EMI Filter
U503	TVS diode for micro SD card	FL600	EMI Filter
U502	Camera 1.8V LDO	U506	Hook Sense Comparator
U300	TVS diode for USIM card	U301	Memory
FL1001	WCDMA TX Filter	U400	PMIC6650-2M
Q1000	WCDMA PAM PA_ON Switch	FL1000	FEM
U1005	RFR6250	SW1000	Mobile S/W
U1003	HDET	Q402	External charger Supply switching

### 3. TECHNICAL BRIEF

#### 2-3. SUB Bottom Side



#### 2-4. SUB Top Side

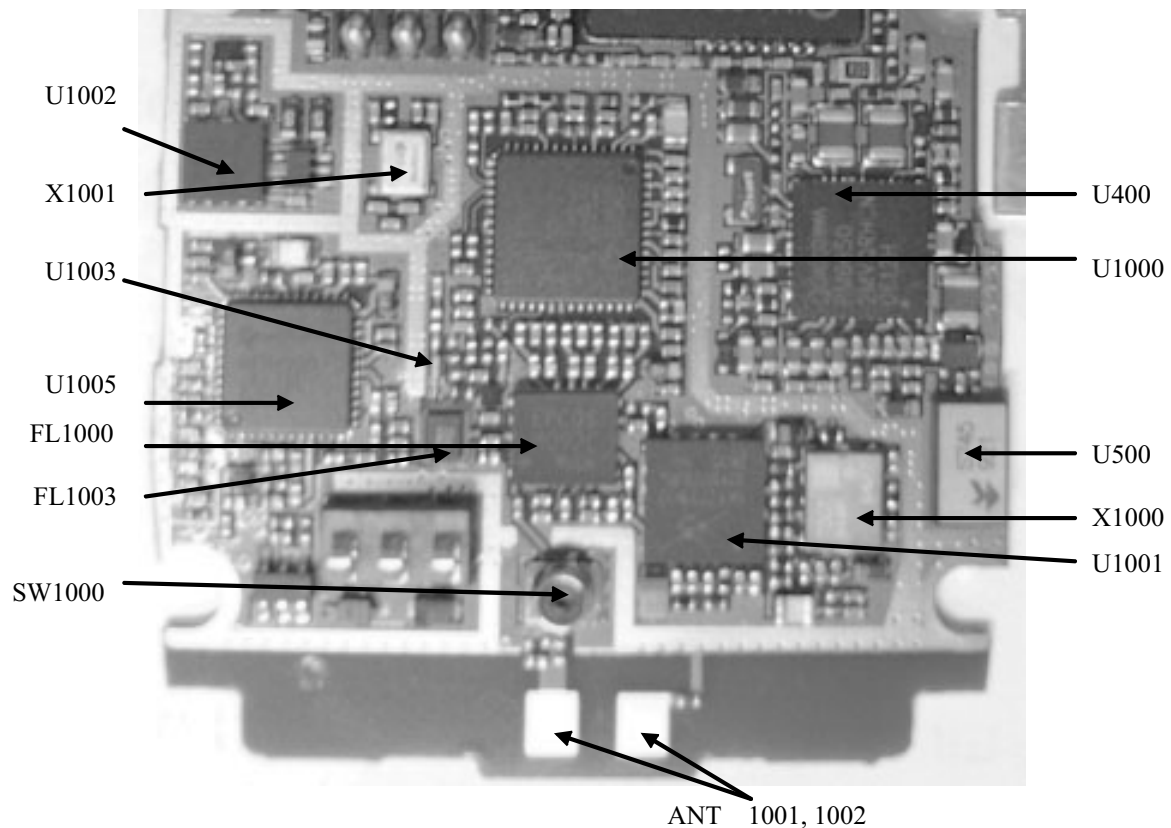


Reference	Description	Reference	Description
ANT700	Bluetooth Antenna	BAT700	Back Up battery
U703	Bluetooth module	CON702	Sub board connector
U704	Bluetooth module clock buffer		
U705	Camera detect MR sensor		

## 4. TROUBLE SHOOTING

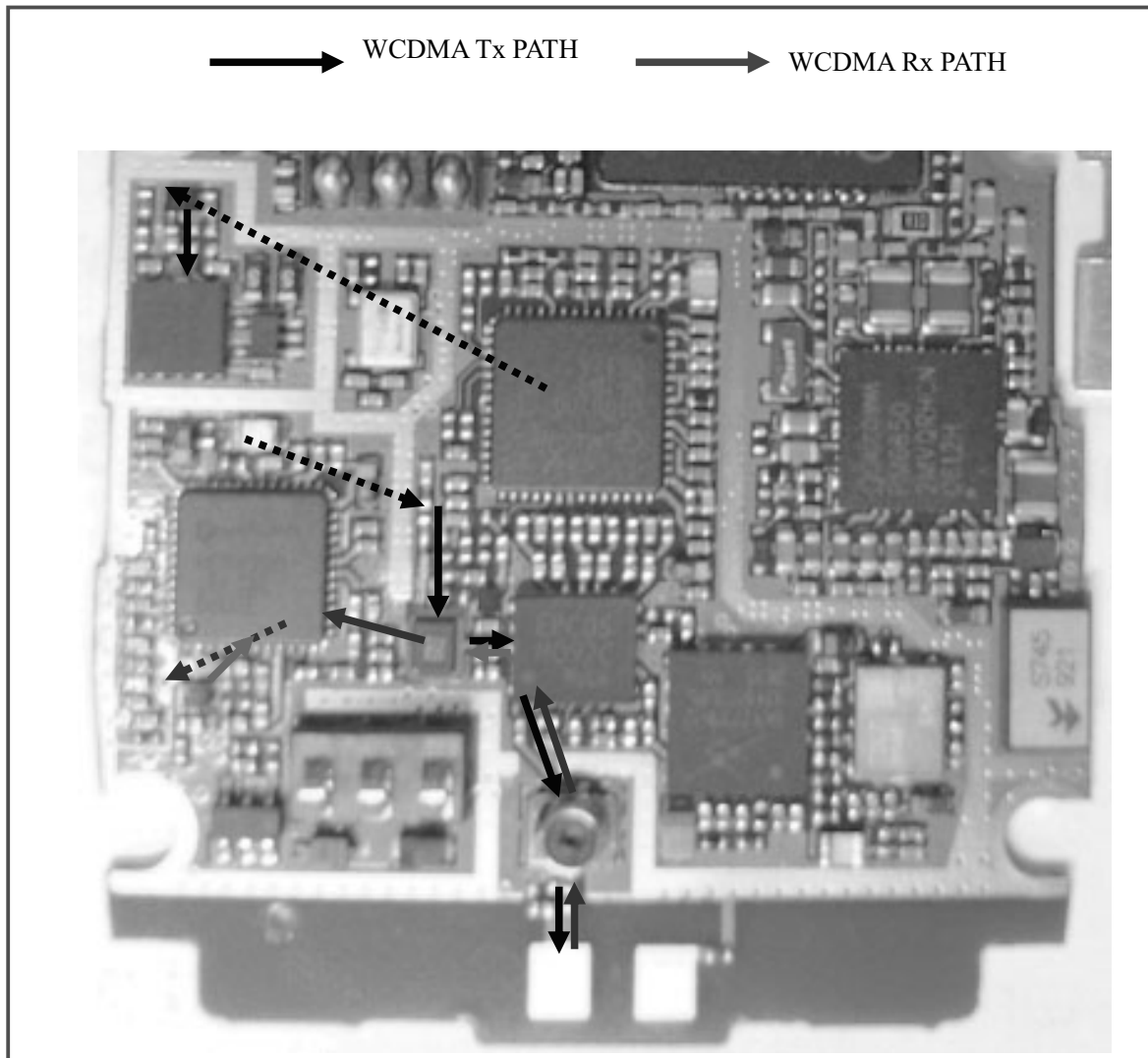
## 4. TROUBLE SHOOTING

### 4.1 RF Component



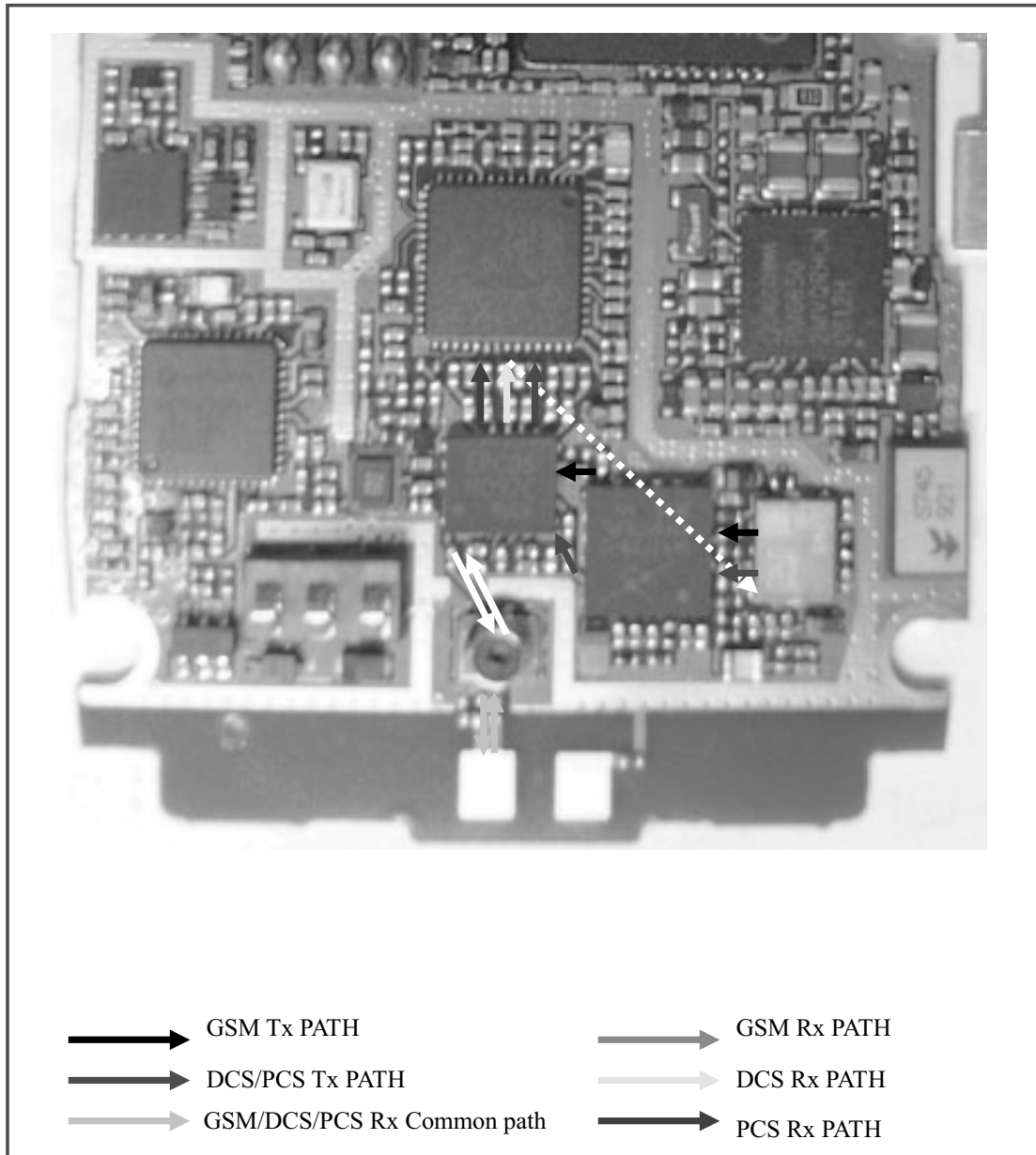
Reference	Description	Reference	Description
X1001	VCTCXO(19.2MHz)	U1003	HDET IC
U1005	WCDMA Receiver IC(RFR6250)	FL1003	WCDMA Duplexer
U1000	GSM/WCDMA Transceiver IC	U1002	WCDMA PAM
X1000	GSM TX VCO	FL1000	Front End Module
ANT1001/1002	ANT contact pad	SW1000	ANT S/W
U500	Mic	U1001	

### 4.2 SIGNAL PATH



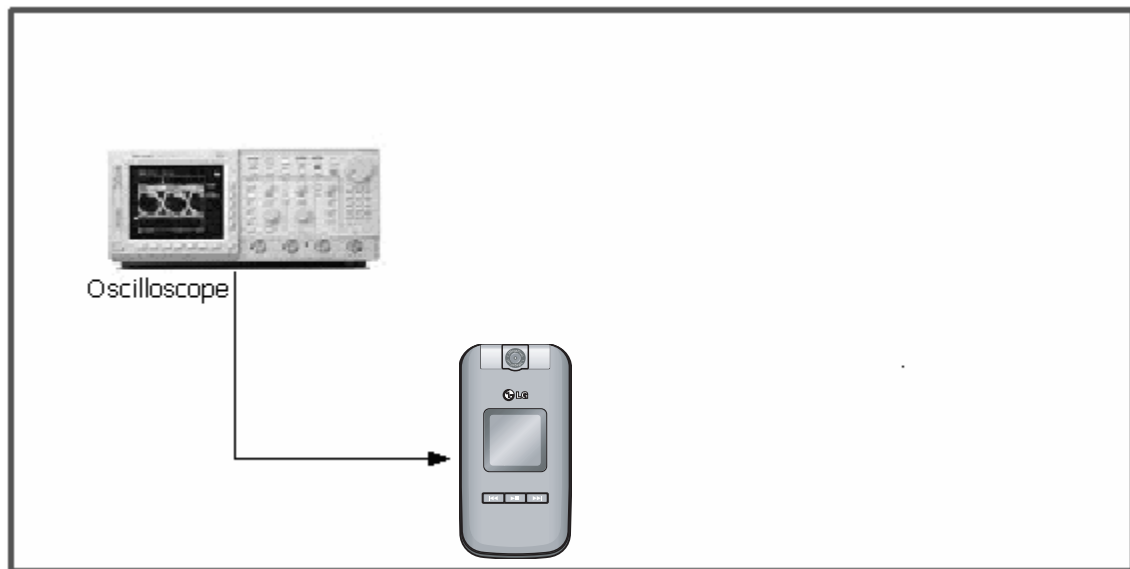


## 4. TROUBLE SHOOTING



### 4.3 Checking VCTCXO Block

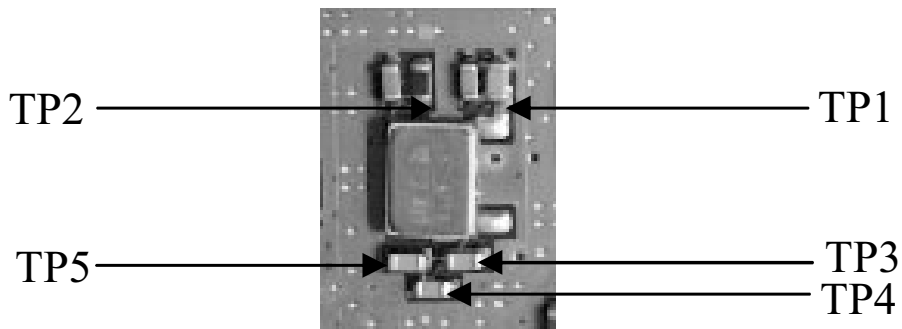
The reference frequency (19.2MHz) from X1001 (VCTCXO) is used WCDMA TX part, GSM part and BB part.



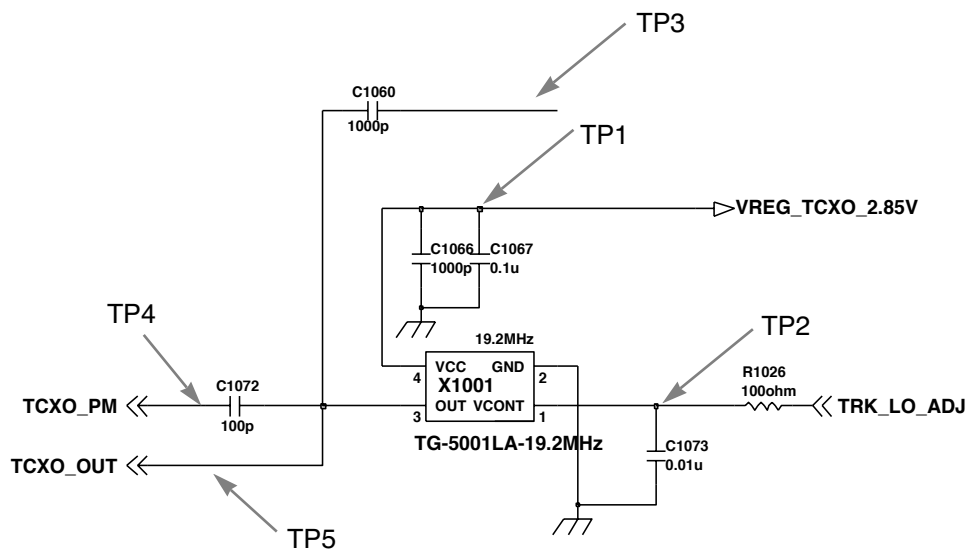
## 4. TROUBLE SHOOTING

### Check 1. Crystal part

If you already check this crystal part, you can skip check 1.

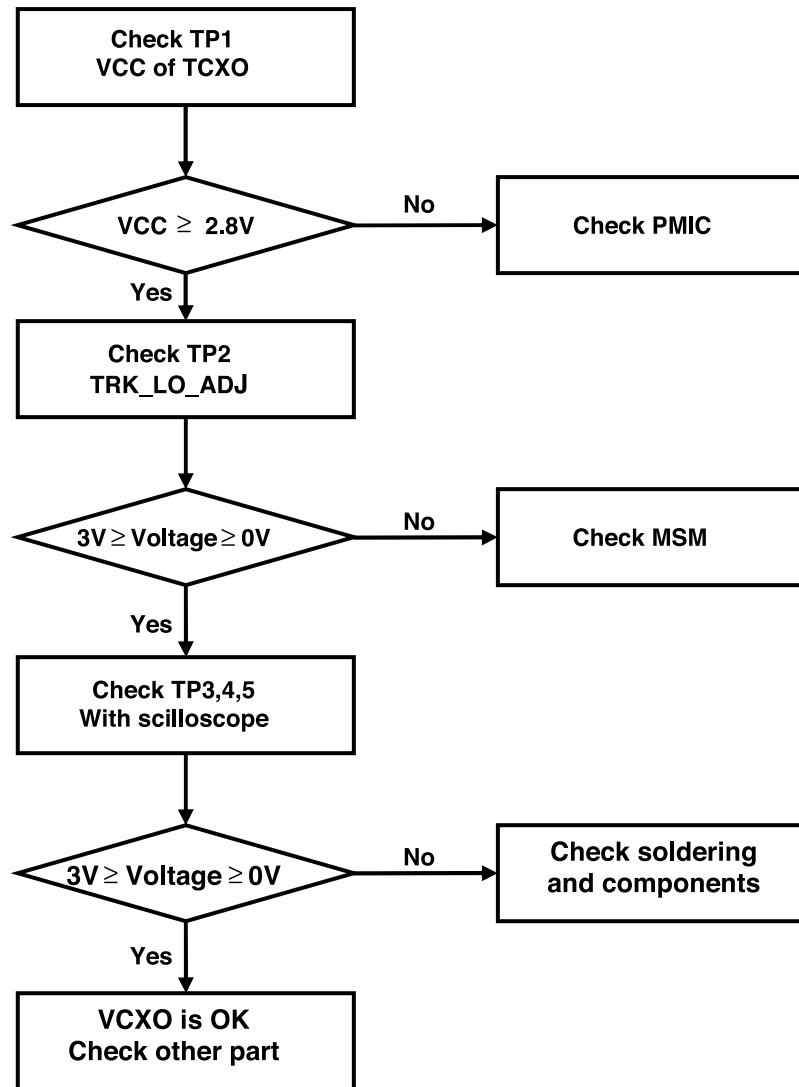


Test Point (Crystal Part)



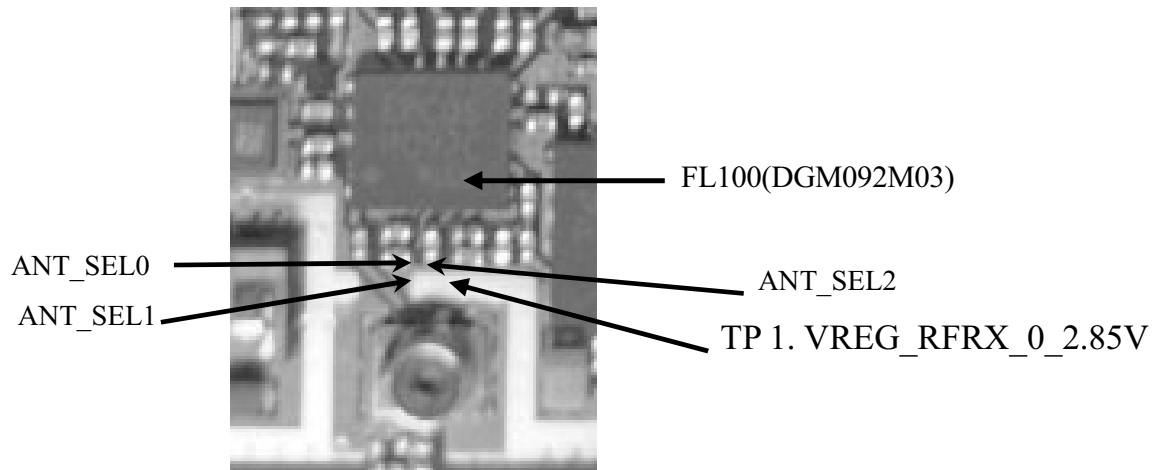
Schematic of the Crystal Part

## 4. TROUBLE SHOOTING

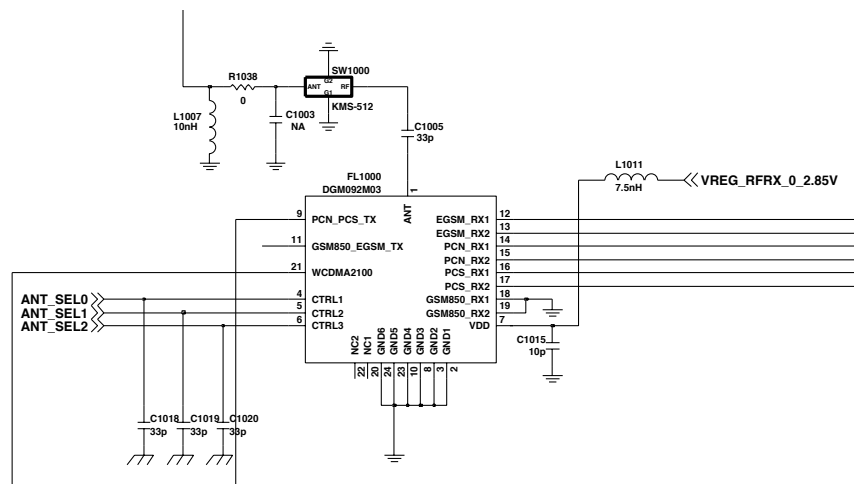


## 4. TROUBLE SHOOTING

### 4.4 Checking Ant. SW Module Block



**Antenna Switch Block(Bottom)**



**Schematic of the Antenna Switch Block**

## 4. TROUBLE SHOOTING

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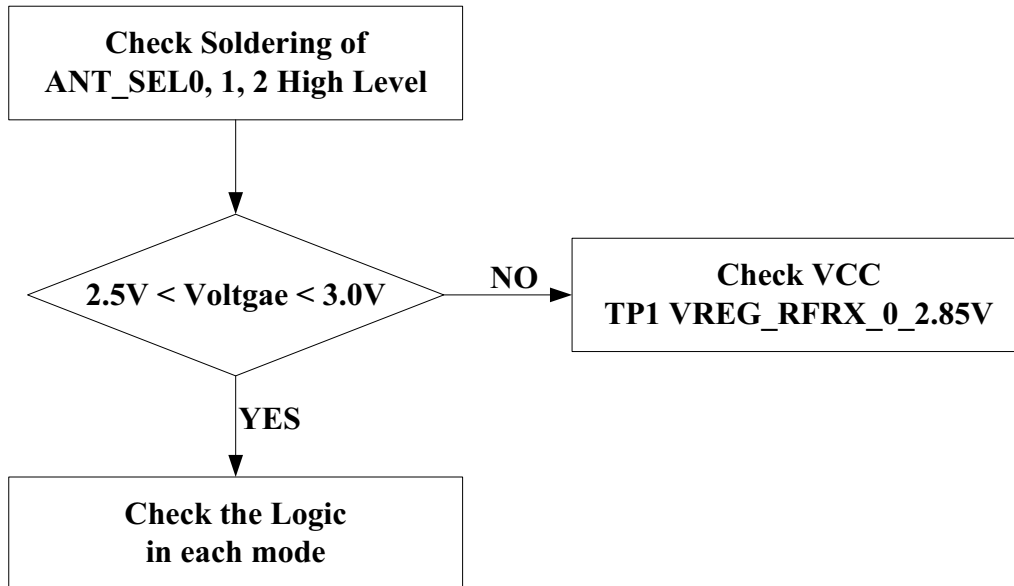
Mode	ANT_SEL0	ANT_SEL1	ANT_SEL2
EGSM TX	High	Low	High
DCS/PCS TX	Low	High	High
EGSM RX	High	High	Low
DCS RX	Low	High	Low
PCS RX	High	Low	Low
UMTS	Low	Low	High

**Logic Table of the Antenna Switch**

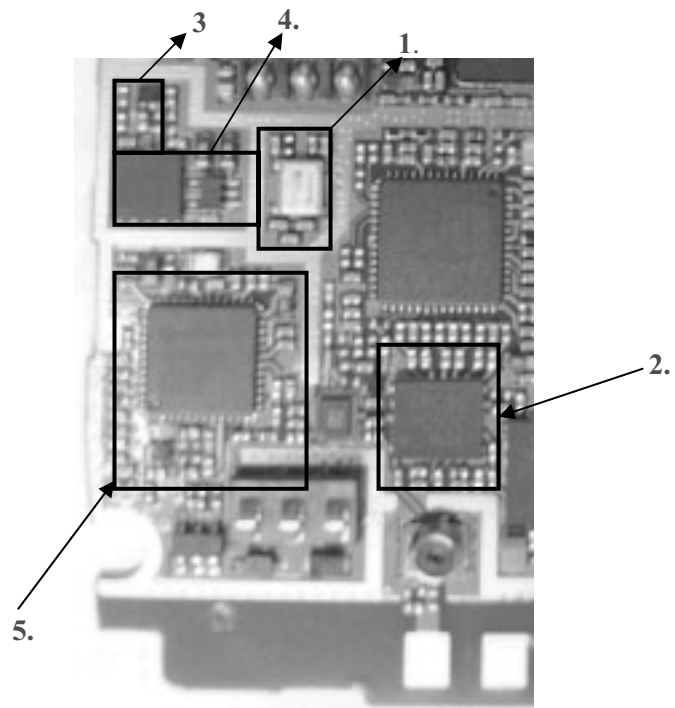
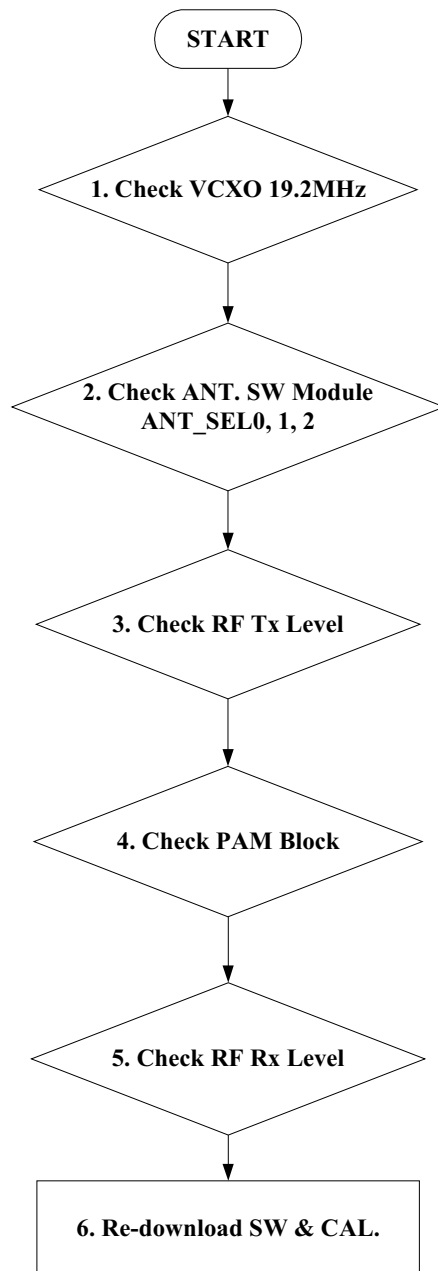
## 4. TROUBLE SHOOTING

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### Checking Switch Block power source



### 4.5 Checking WCDMA Block





## 4. TROUBLE SHOOTING

### 4.5.1 Checking VCXO Block

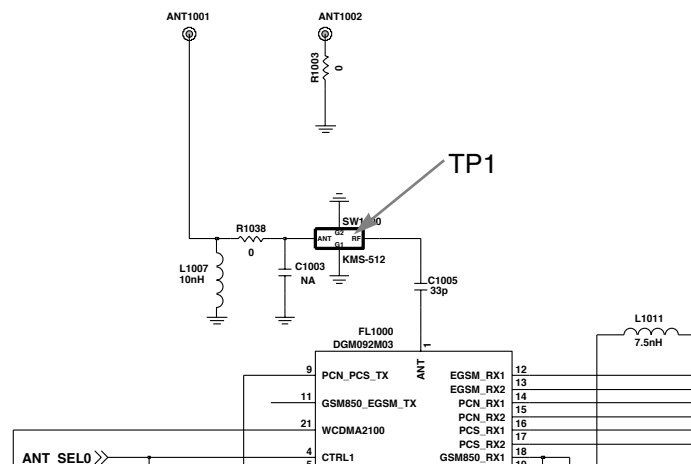
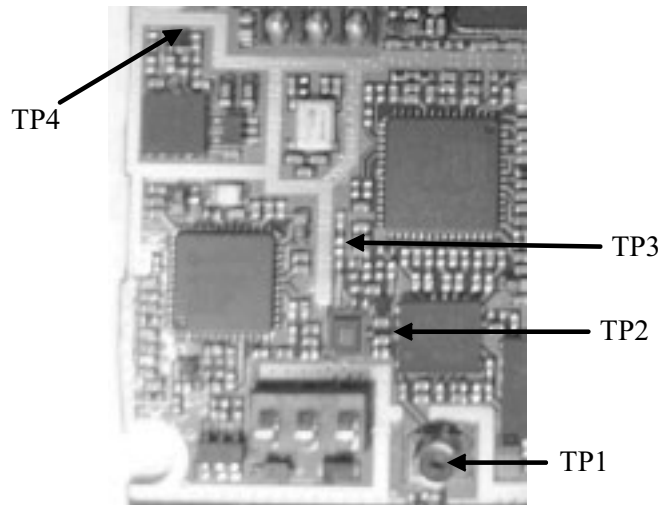
Refer to 4.3

### 4.5.2 Checking Ant. SW module

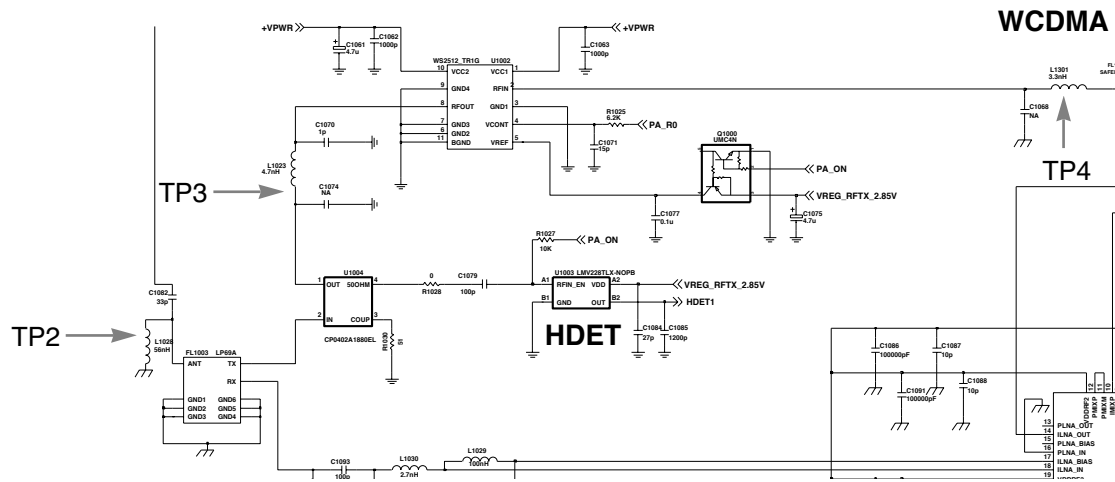
Refer to 4.4

### 4.5.3 Checking RF TX Level

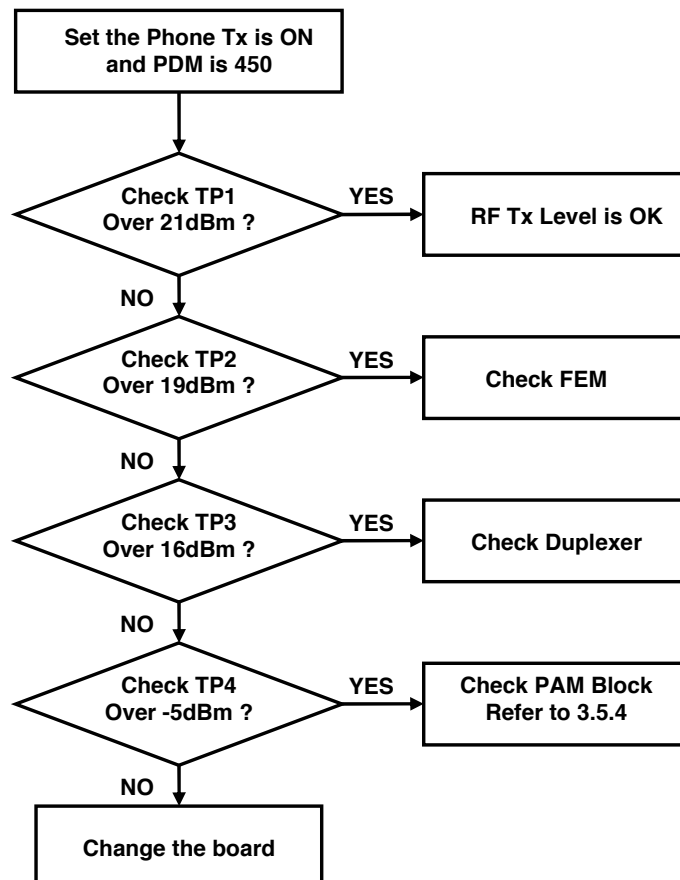
Test Point (RF TX Level)



## 4. TROUBLE SHOOTING



For testing, Max power output is needed.



## 4. TROUBLE SHOOTING

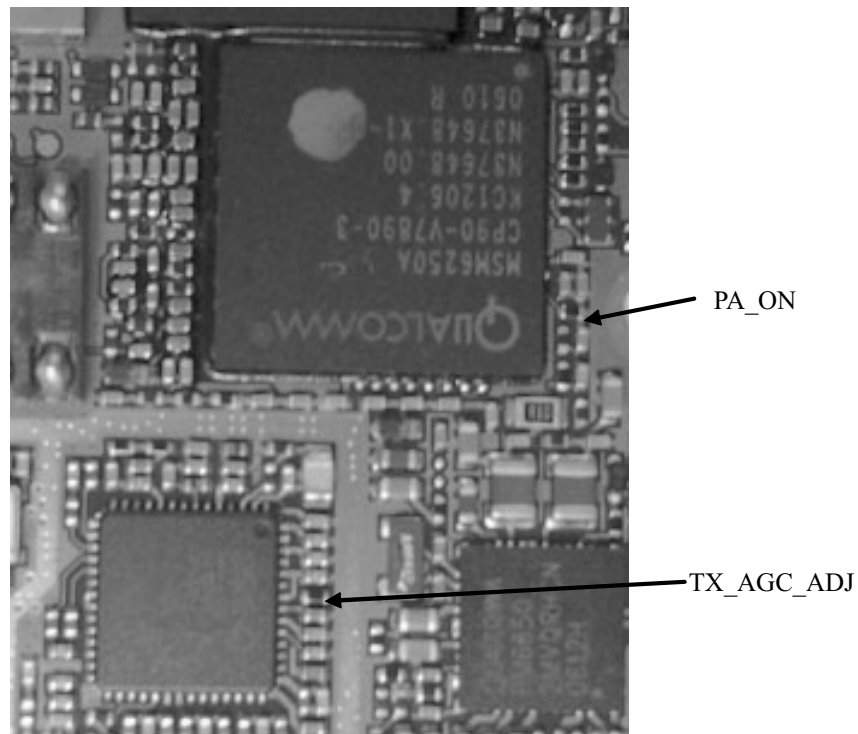
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### 4.5.4 Checking PAM Block

#### • PAM control signal

PA\_ON : WCDMA Tx Power Detect IC(HDET) Enable

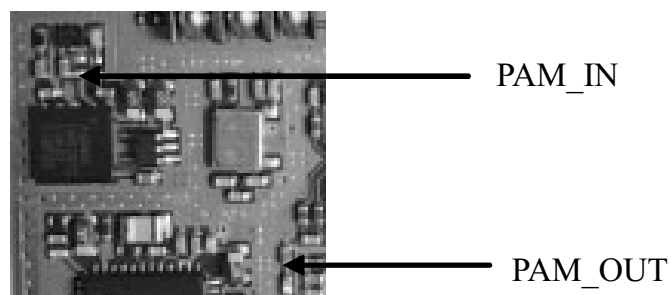
TX\_AGC\_ADJ : WCDMA Tx Power Amp Gain Control



PA\_ON must be HIGH(over 2.5V)

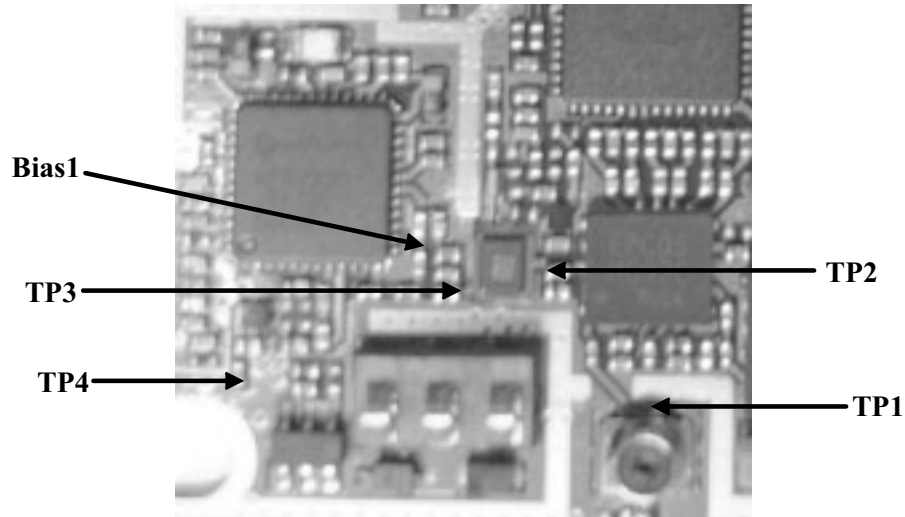
PA\_FET\_N must be LOW if the max Tx power is set (lower than 0.5V)

#### PAM IN/OUT Signal

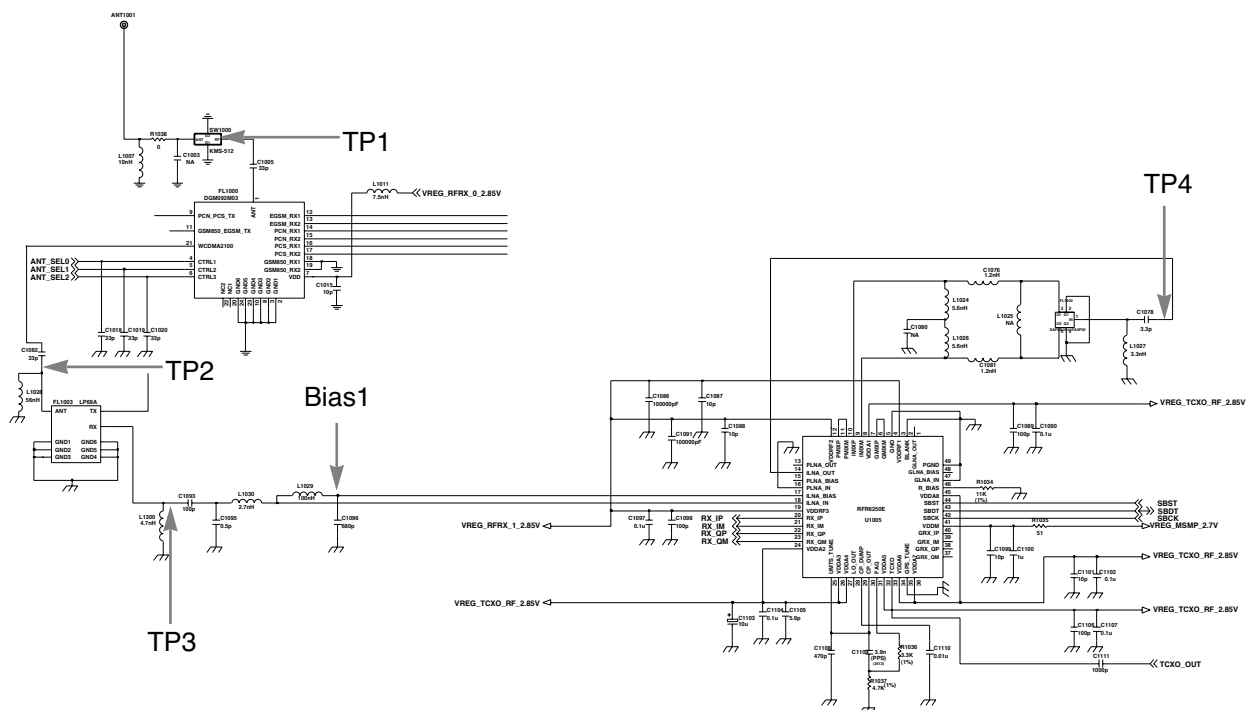


**PAM OUT must be over 16dBm / PAM IN must be over -5dBm**

#### 4.5.5 Check RF Rx Level

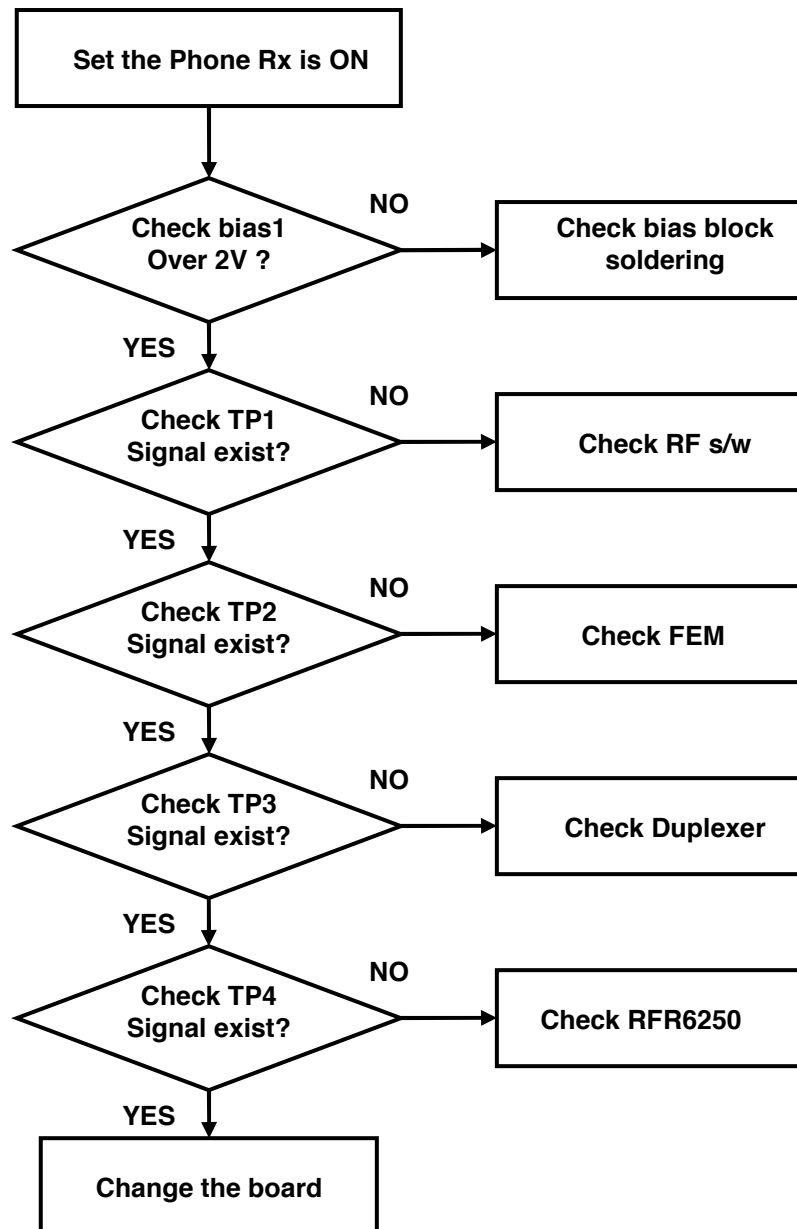


### Test Point (RF Rx Level)

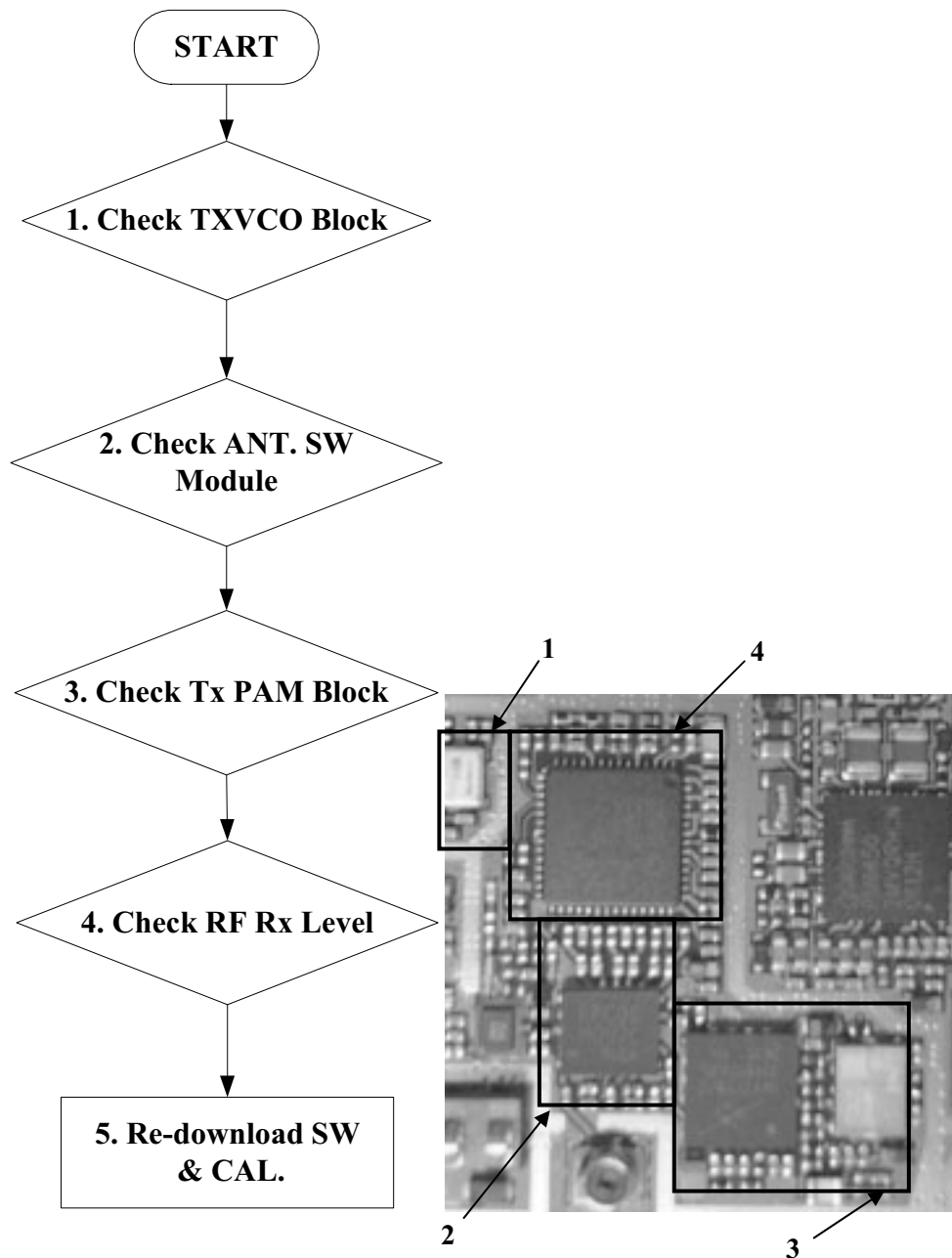


## 4. TROUBLE SHOOTING

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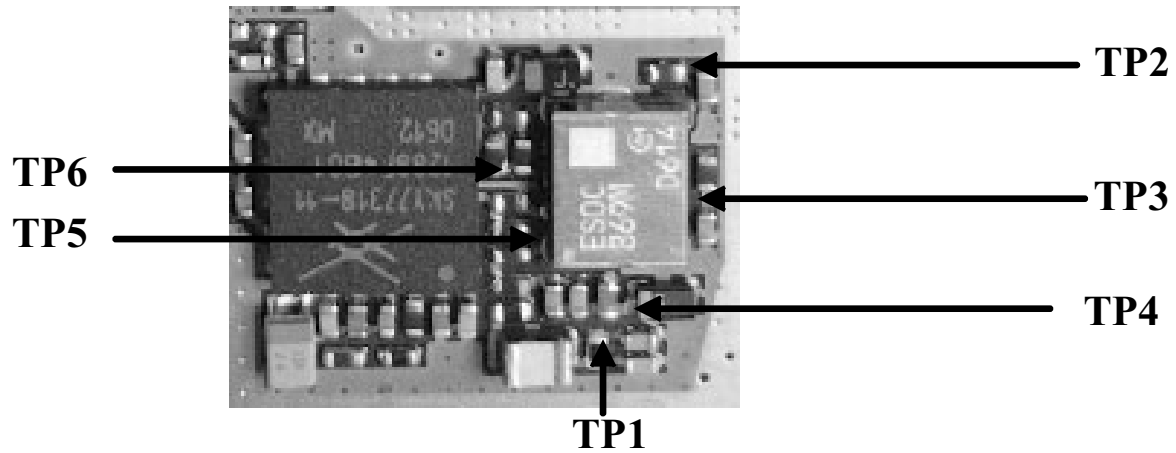


### 4.6 Checking GSM Block

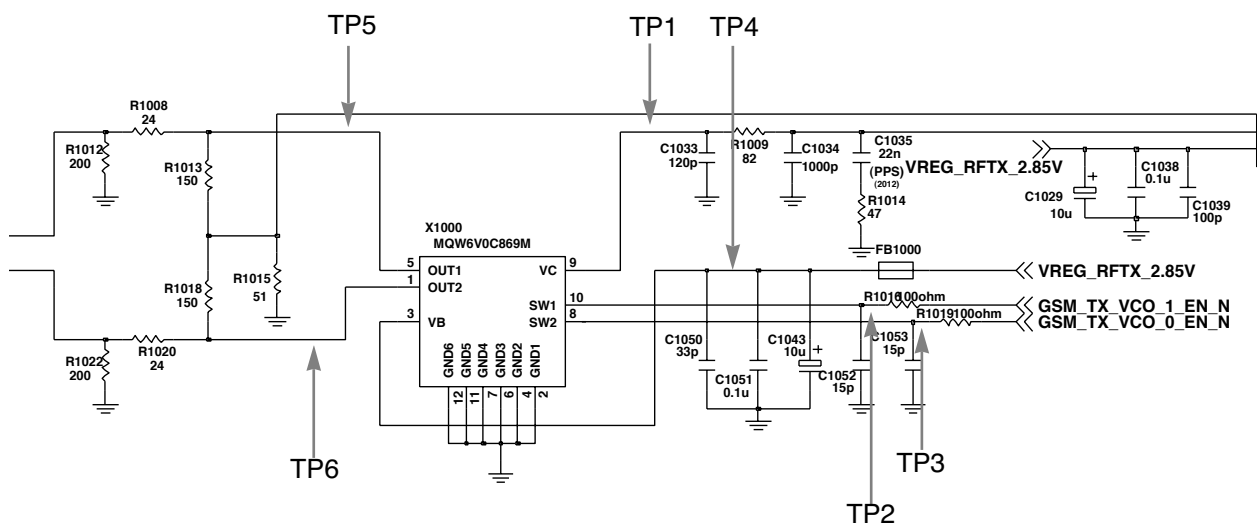


## 4. TROUBLE SHOOTING

### 4.6.1 Checking VCO Block

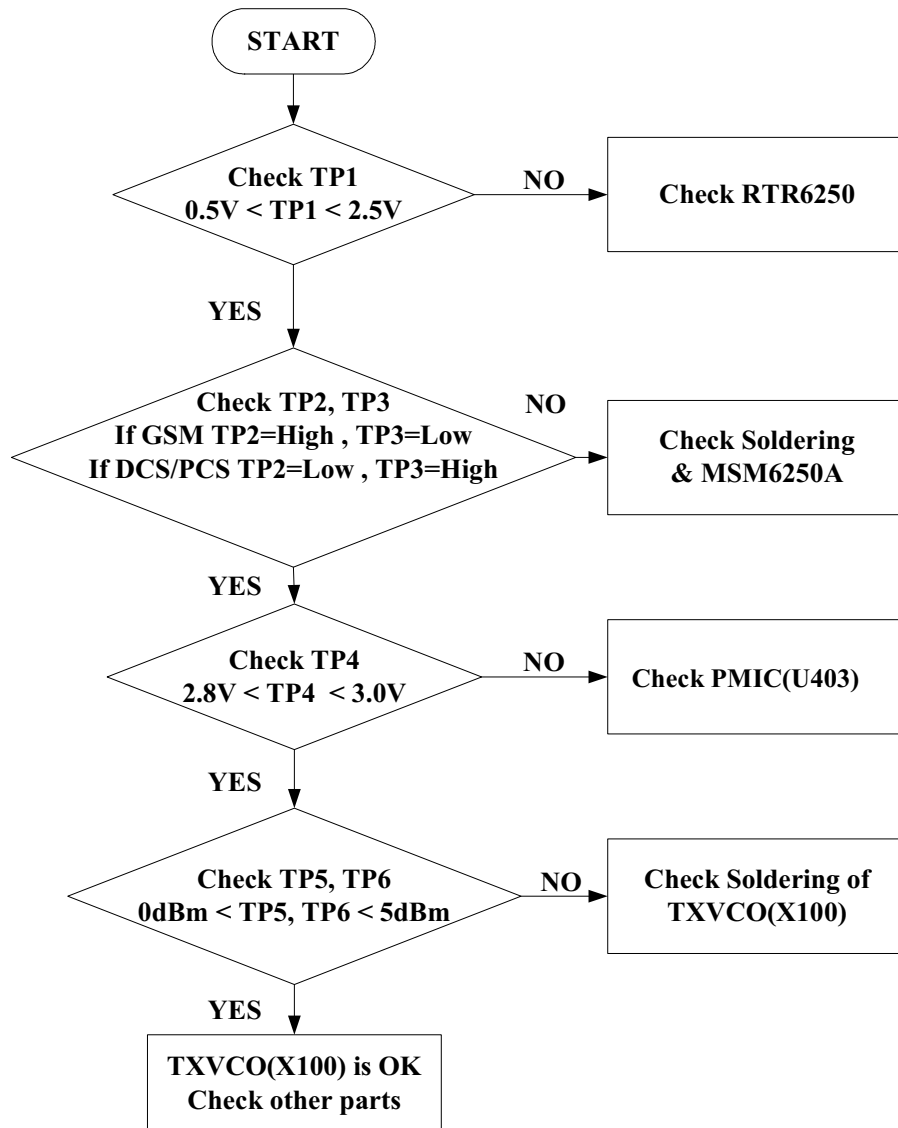


### Test Point (TXVCO Level)



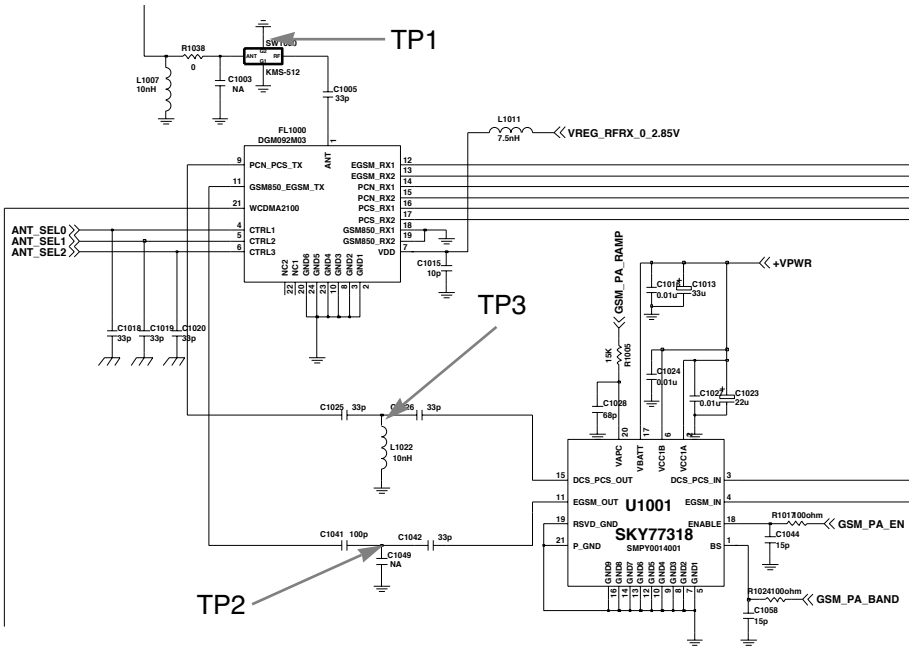
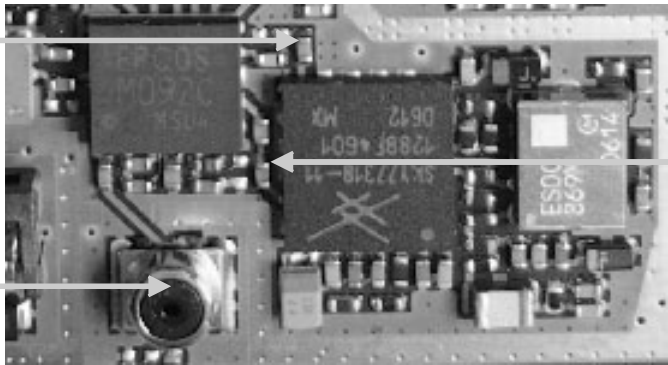
Schematic of RF TXVCO

## 4. TROUBLE SHOOTING



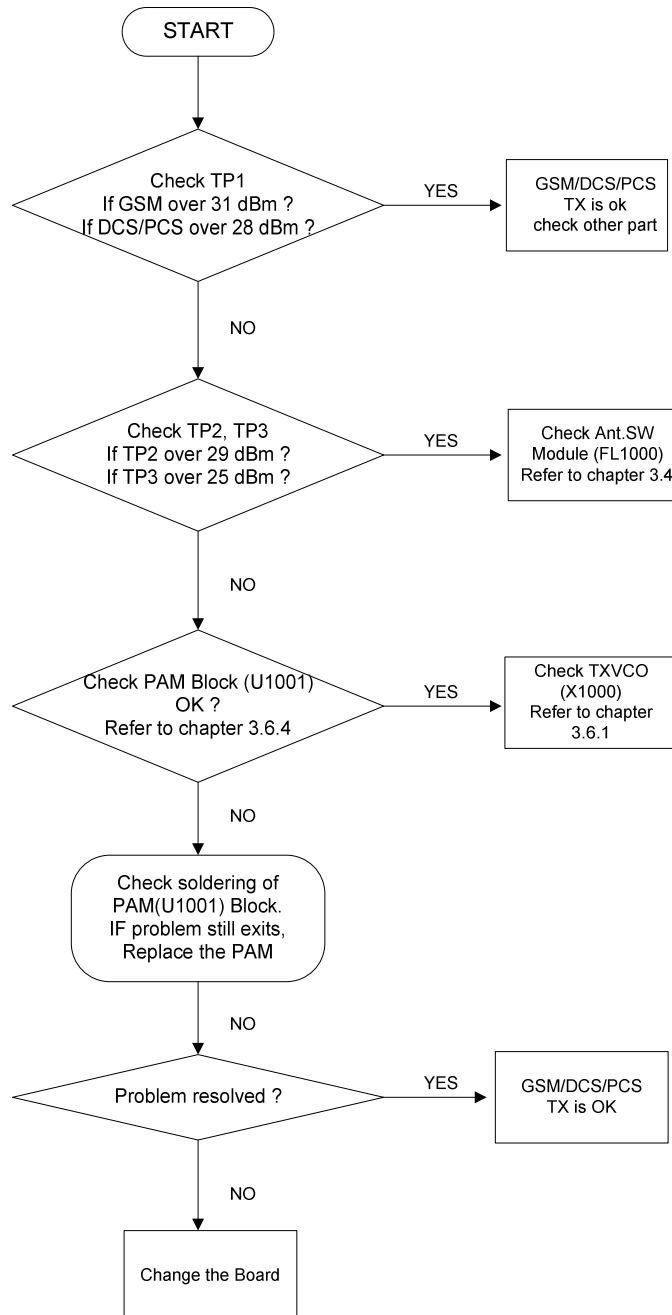


**Refer to chapter 4.4**



### Schematic of RF Tx Level

## 4. TROUBLE SHOOTING



## 4. TROUBLE SHOOTING

### 4.6.4 Checking PAM Block

#### PAM Control Signal

TP1. GSM\_PA\_RAMP : Power Amp Gain Control. typically,  $0.5V < V_{apc} < 2.6V$ ,

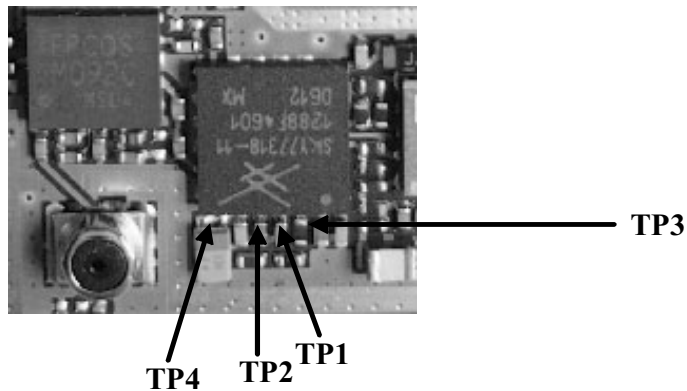
TP2. GSM\_PA\_EN : Power Amp Enable

(Power ON : higher than 2.5V , Power OFF : lower than 0.7V)

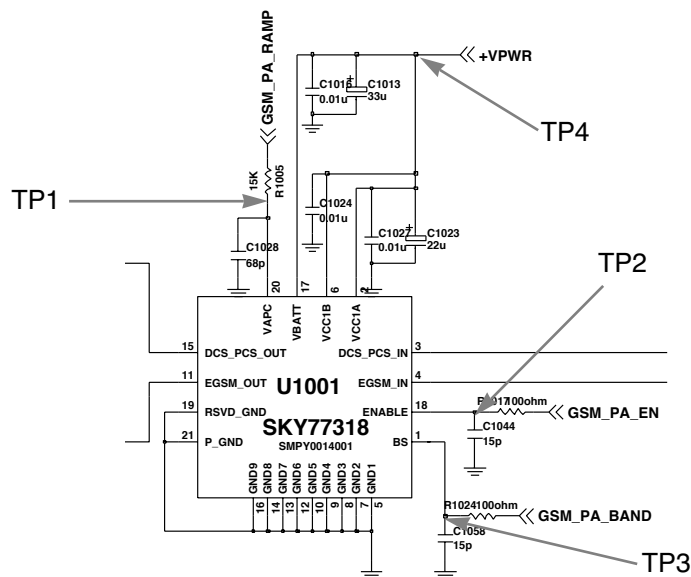
TP3. GSM\_PA\_BAND : Power Amp Band Selection Control

(GSM Mode : lower than 0.7V , DCS/PCS Mode : higher than 2.5V)

TP4. +VPWR : PAM Supply Voltage Vcc higher than 3.28V

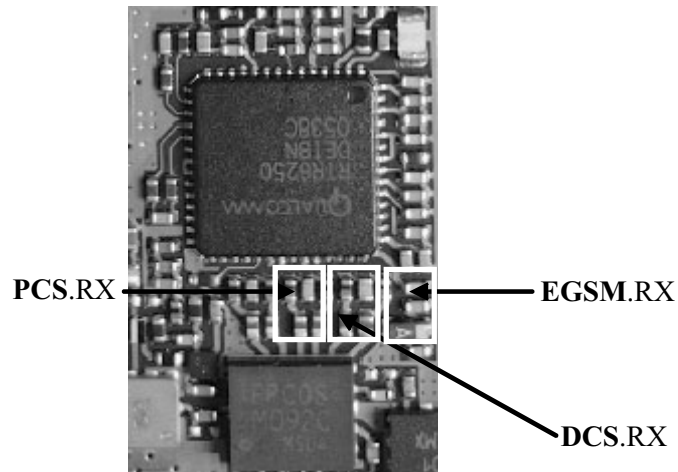


Test Point (RF Tx Level)

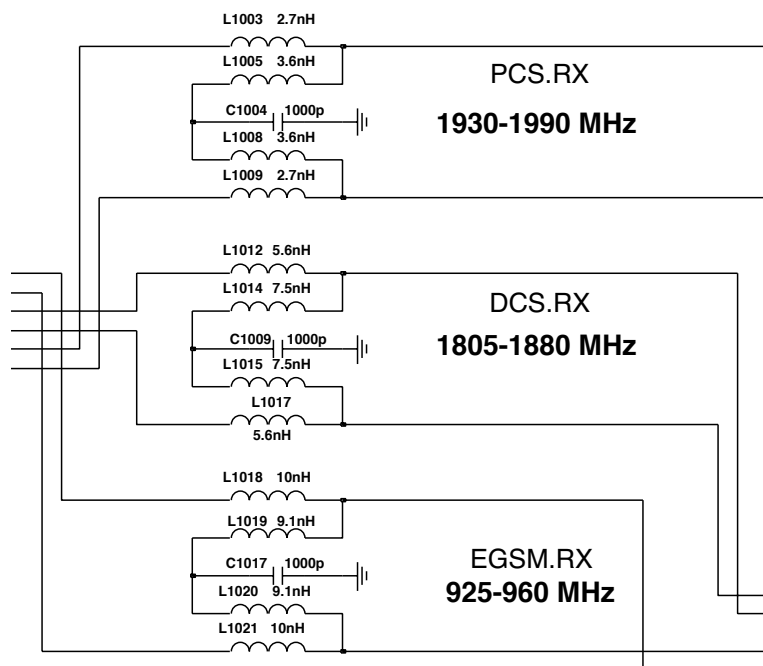


Schematic of PAM block

### 4.6.5 Checking RF Rx Block



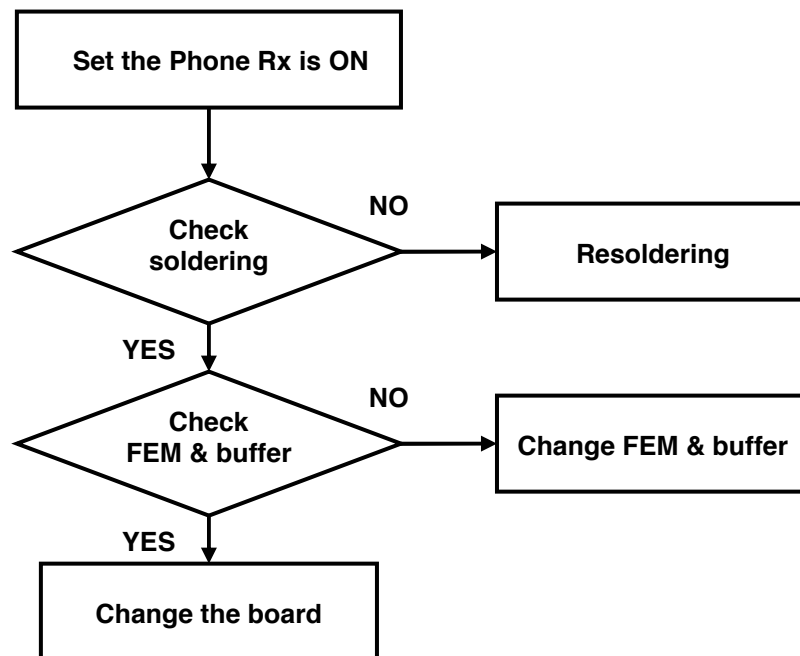
Test Point (RF Rx Level)



Schematic of GSM/DCS/PCS Rx Block

## 4. TROUBLE SHOOTING

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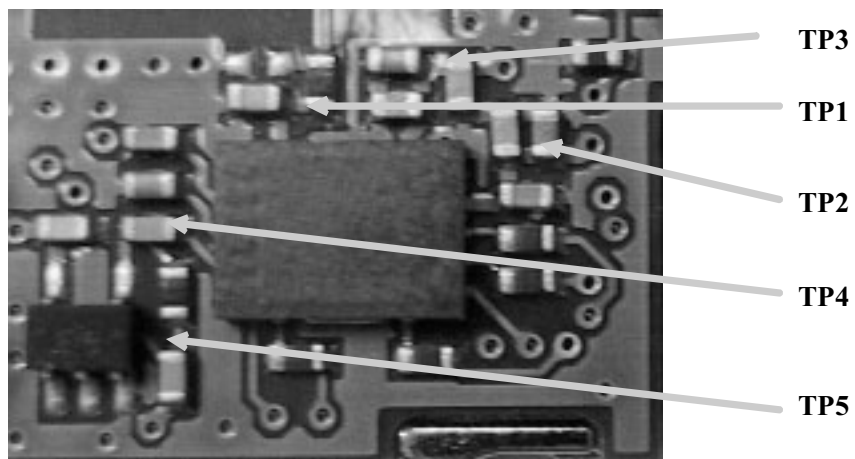


### 4.7 Bluetooth RF Block

#### TC-3000A (Bluetooth Tester)

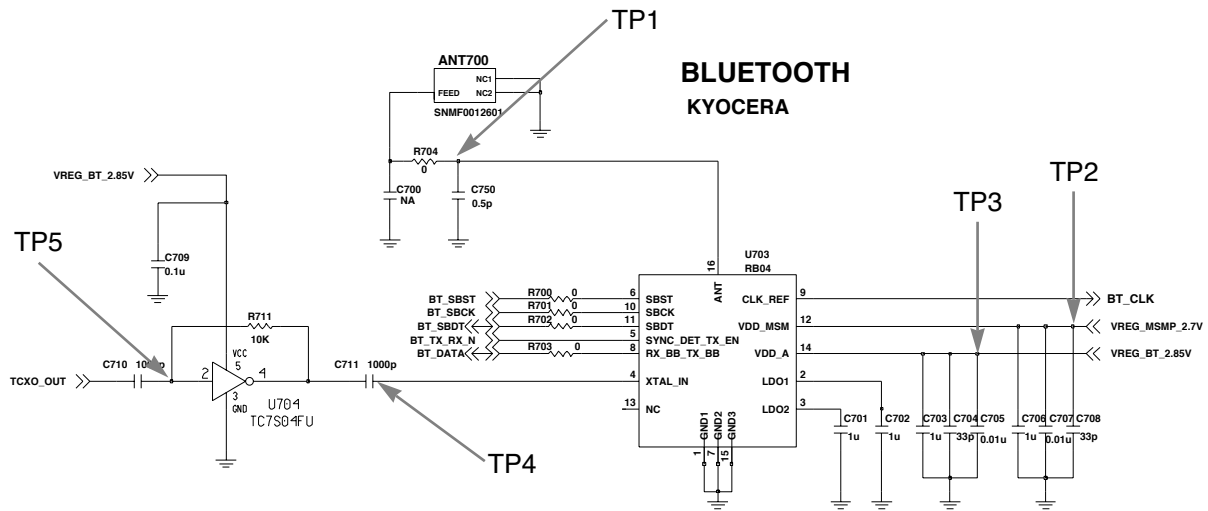


1. Set phone to bluetooth test-mode  
: Enter Test Mode(277634##) -> Module Test Set -> BT DUT -> BT DUT ON
2. Connect phone to bluetooth tester
3. Set channel to 39
4. Measure output-power
5. Check TP1 : output-power > -6 dBm

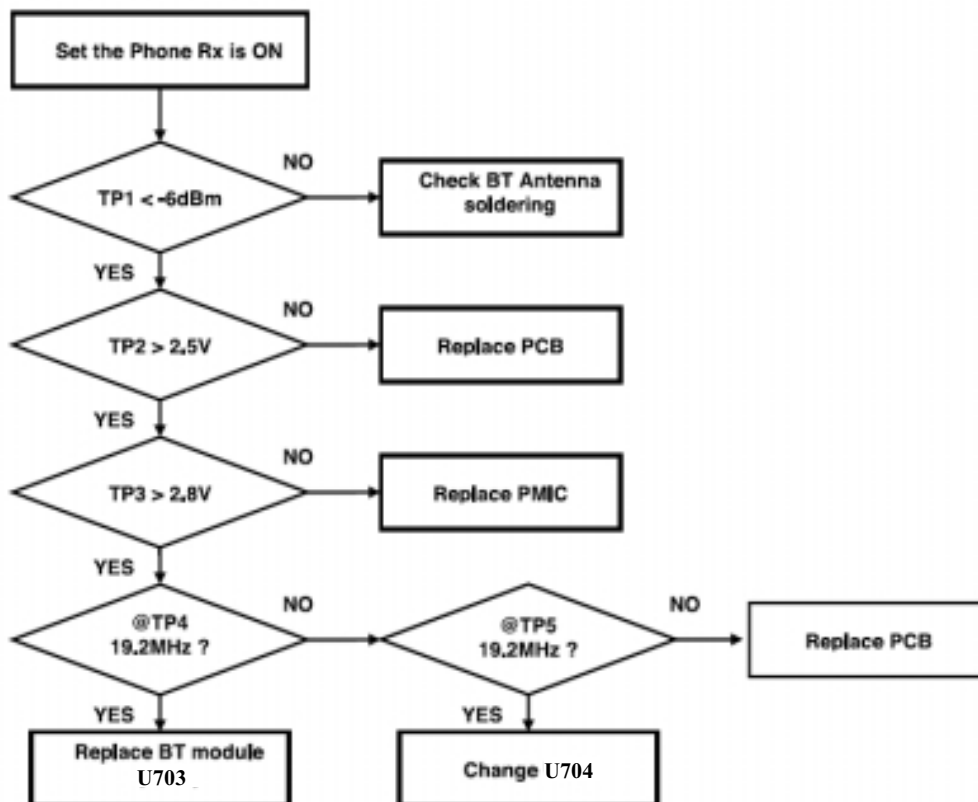


Test Point (Bluetooth Block )

## 4. TROUBLE SHOOTING



Schematic of Bluetooth RF Block

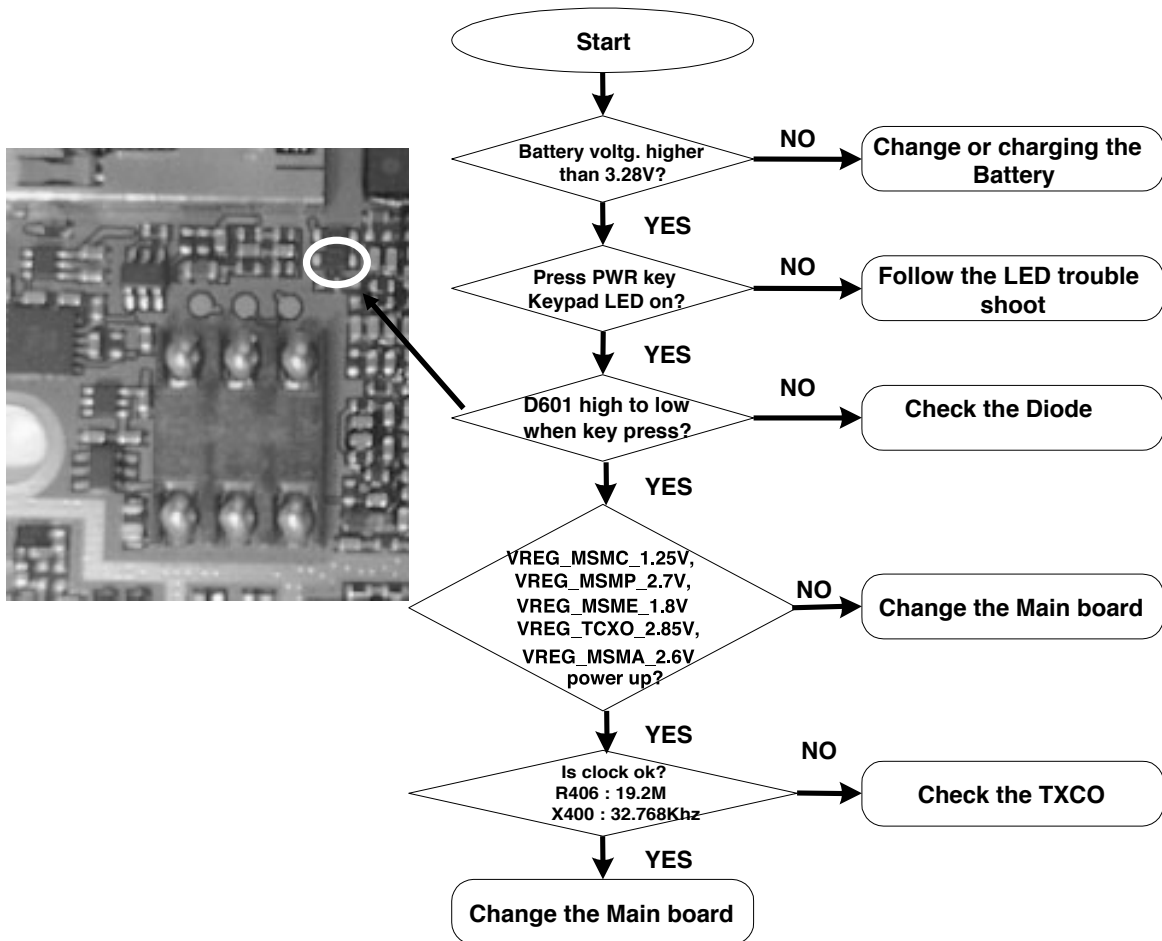


### 4. BB Trouble Shooting

#### 4.8 Power ON Trouble

Power On sequence of KU310 is :

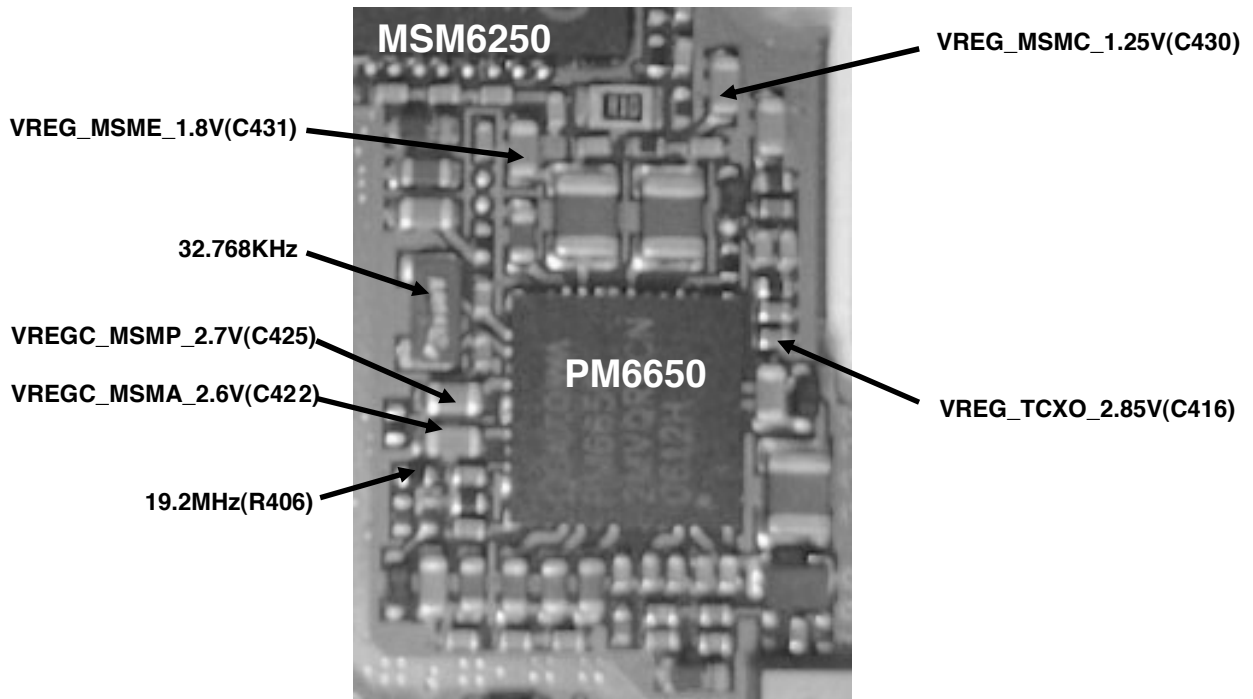
PWR(END) key press -> PM\_ON\_SW\_N go to low(D601),PM6650-2M KPDPWR\_N pin(24) -> PM6650-2M Power Up -> VREG\_MSMC\_1.25V(C430), VREG\_MSME\_1.8V(C431), VREG\_MSMP\_2.7V(C425), VREG\_MSMA\_2.6V(C422), VREG\_TCXO\_2.85V(C416) power up and system reset assert to MSM -> Phone booting and PS\_HOLD(D400) assert High to PMIC(PM6650-2M).





## 4. TROUBLE SHOOTING

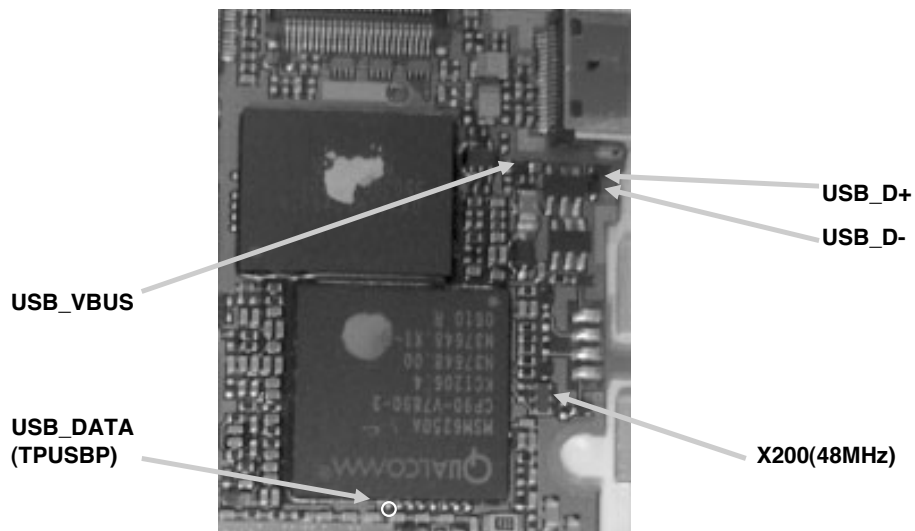
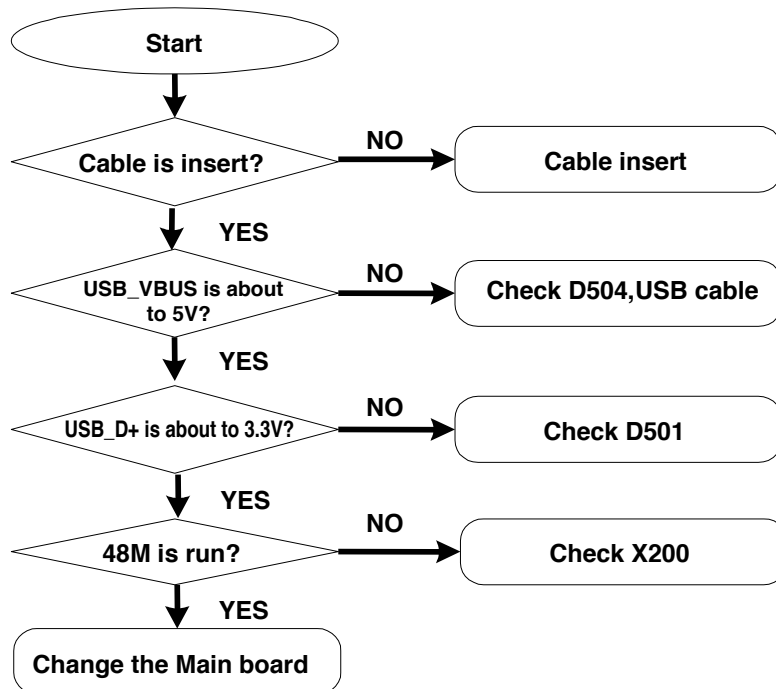
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### 4.9 USB Trouble

USB Initial sequence of KU310 is :

USB connected to KU310 -> USB\_VBUS(D504) go to 5V -> USB\_D+(D501) go to 3.3V -> 48M Crystal on -> USB\_DATA(TPUSBP) is triggered -> USB work.

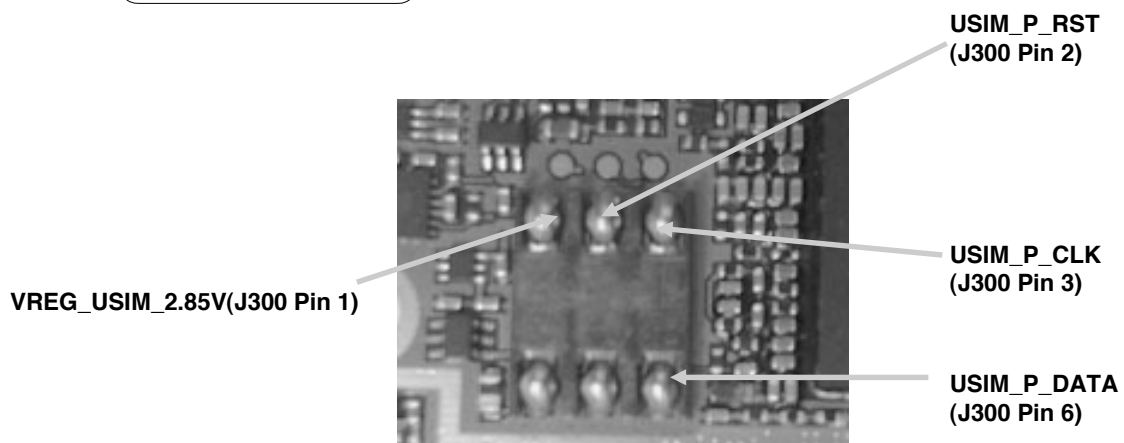
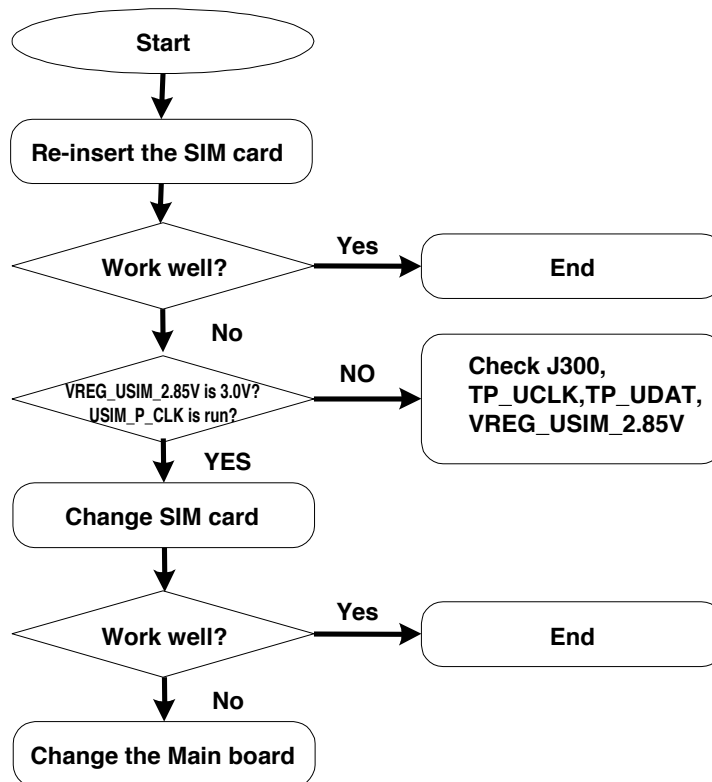


## 4. TROUBLE SHOOTING

### 4.10 SIM Detect Trouble

USB Initial sequence of 600V is :

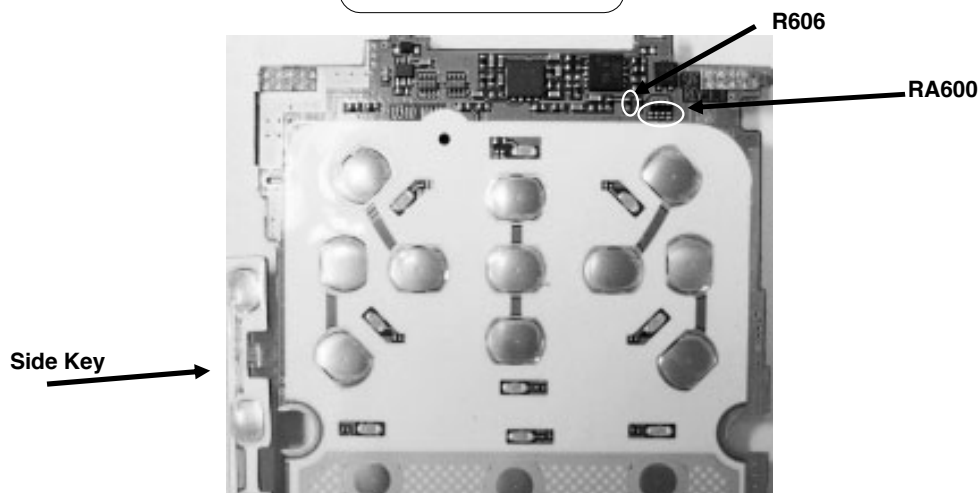
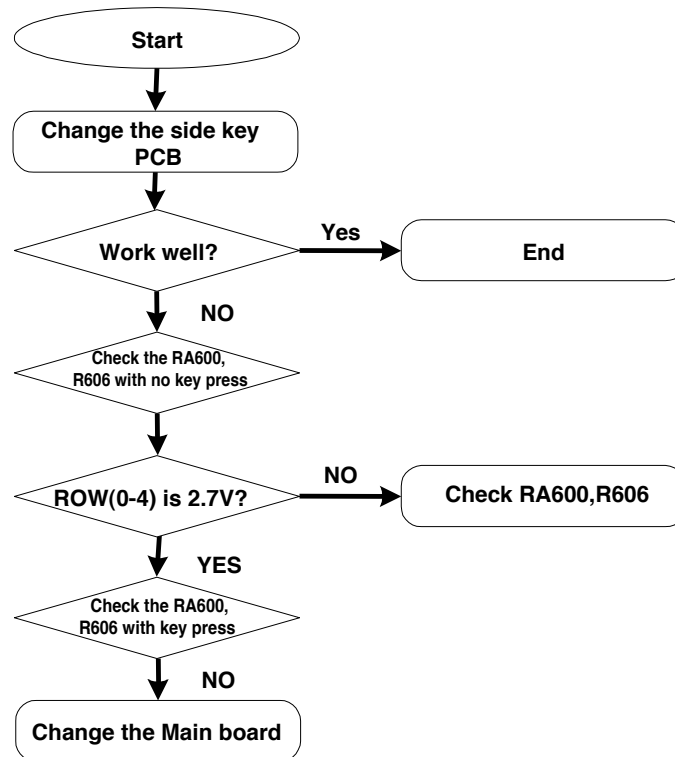
VREG\_USIM\_2.85V(C429 of PM6650-2M) go to 3.0V -> USIM\_CLK,USIM\_RST,USIM\_DATA triggered -> USIM IF work(Schematic and place are refer to SIM technical brief)



### 4.11 Key Sense Trouble

Key Sense sequence of KU310 is :

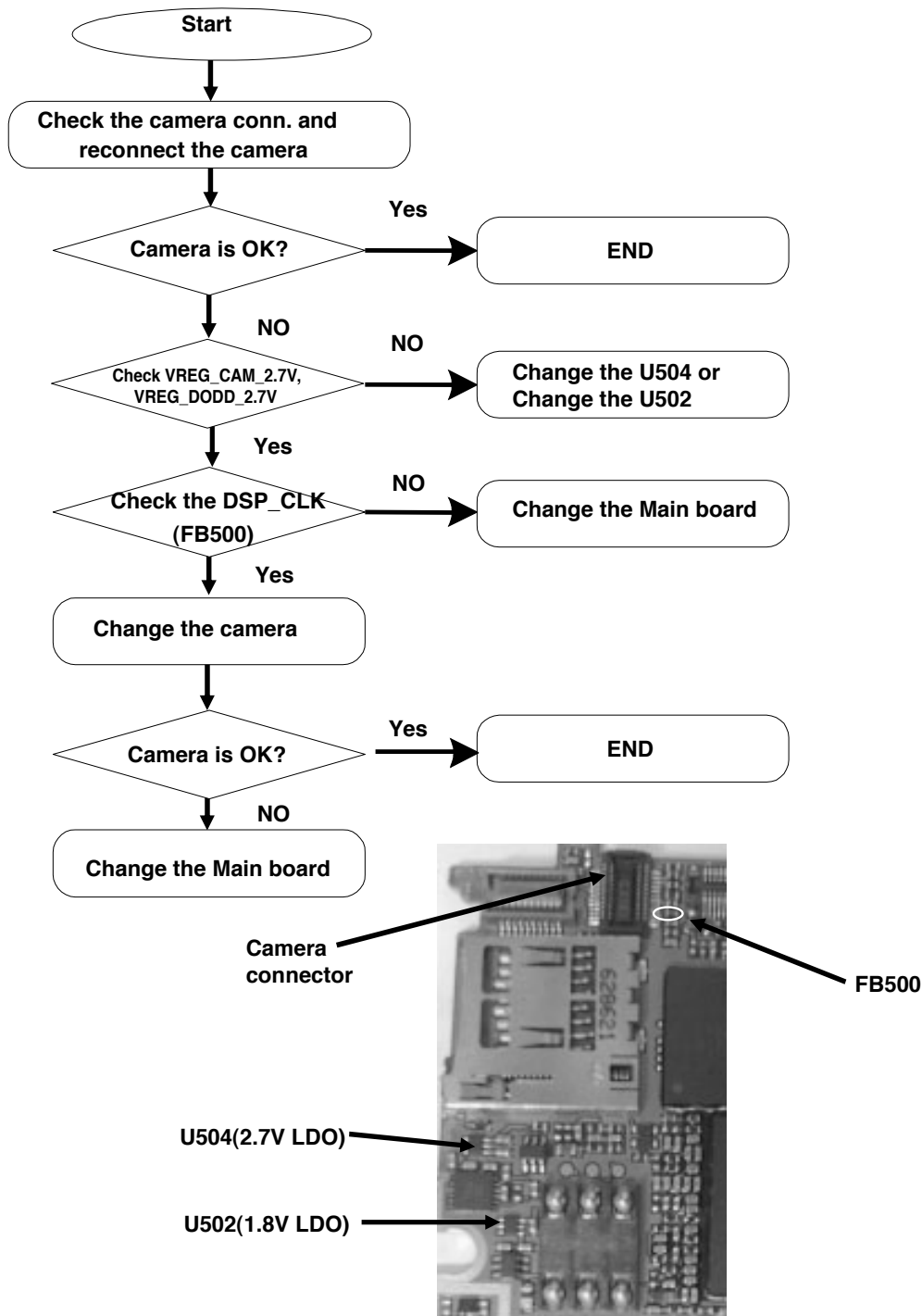
Default condition ROW(0-4) is 2.7V -> Press the key -> Corresponding row(x) and col(x) go to 0V -> Key sensing



## 4. TROUBLE SHOOTING

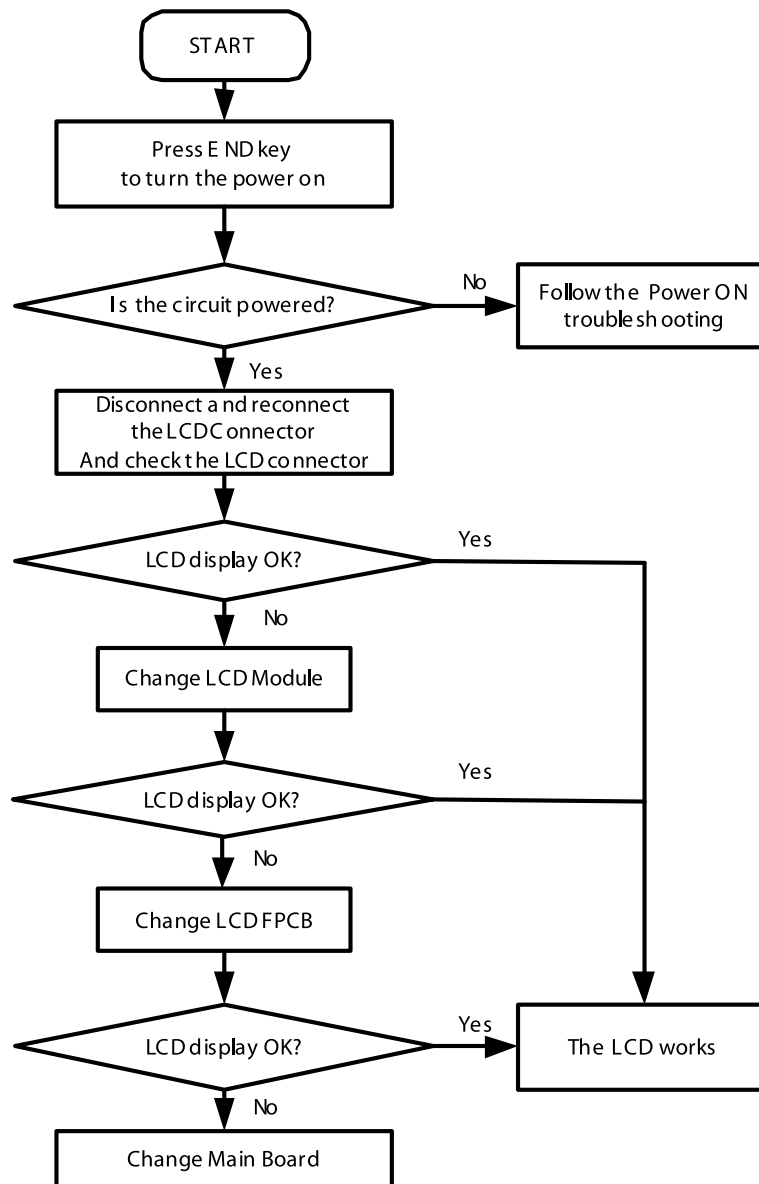
### 4.12 Camera Trouble

Camera control signals are generated by MSM6250A and directly connected with MSM6250A.



### 4.13 Main LCD Trouble

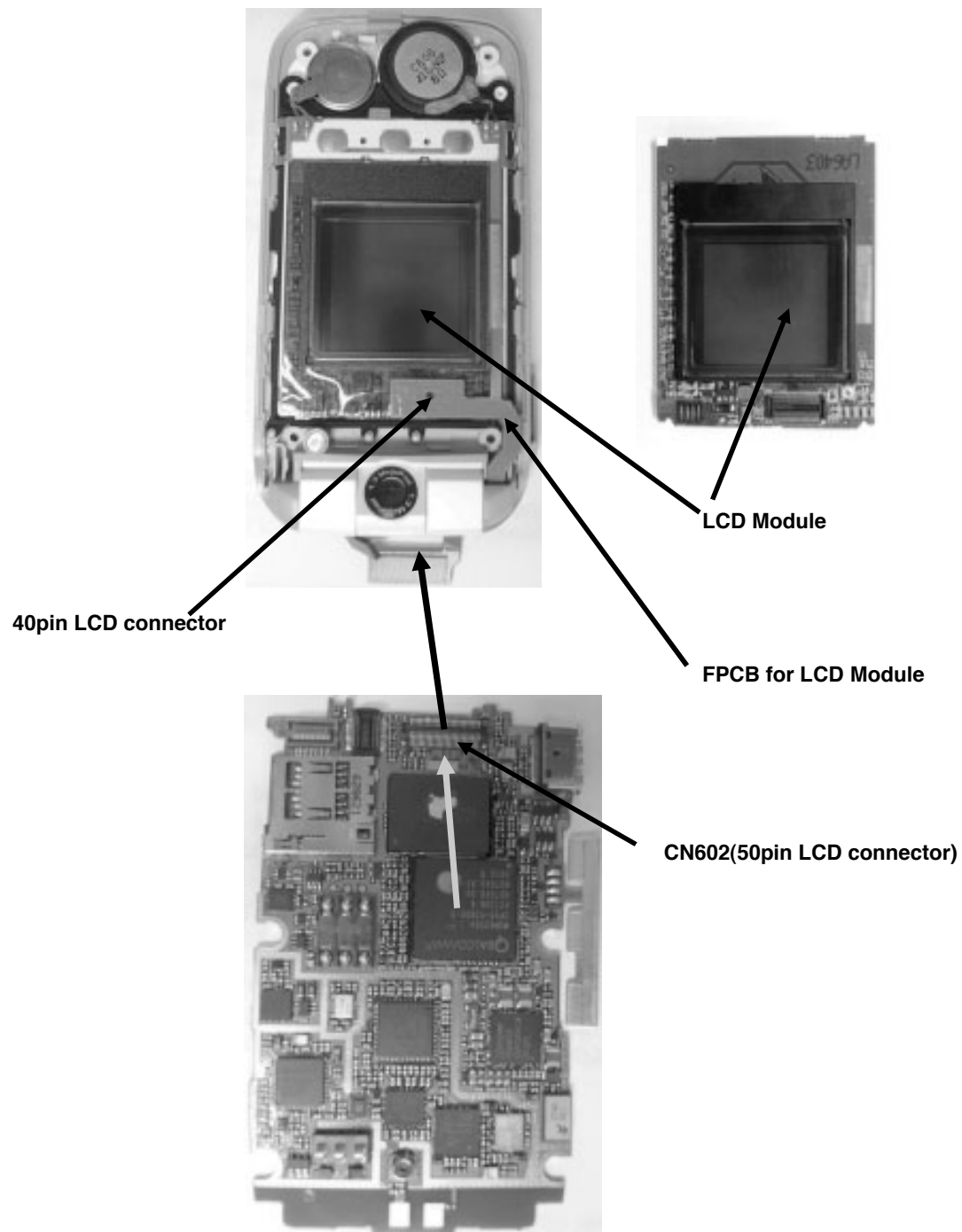
Main LCD control signals are generated by MSM6250A. Those signal's path are :  
MSM6250A -> MAIN B'd -> CN602 -> LCD FPCB and LCD Module



## 4. TROUBLE SHOOTING

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### LCD Control data flow

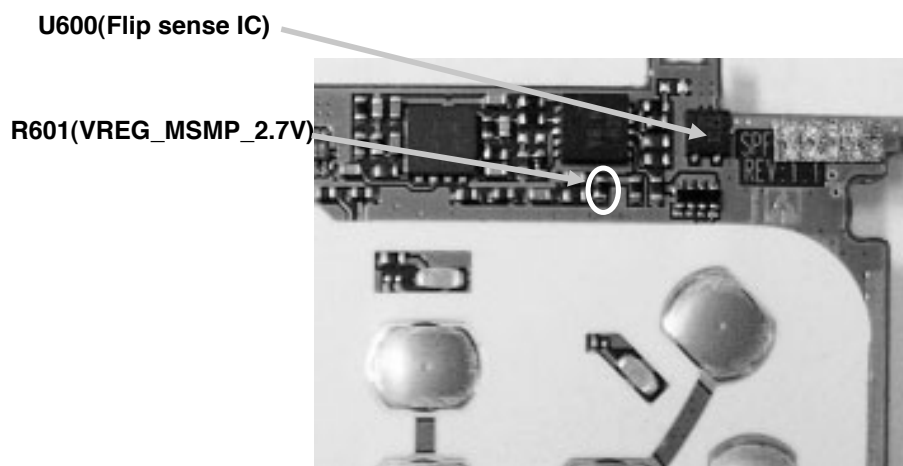
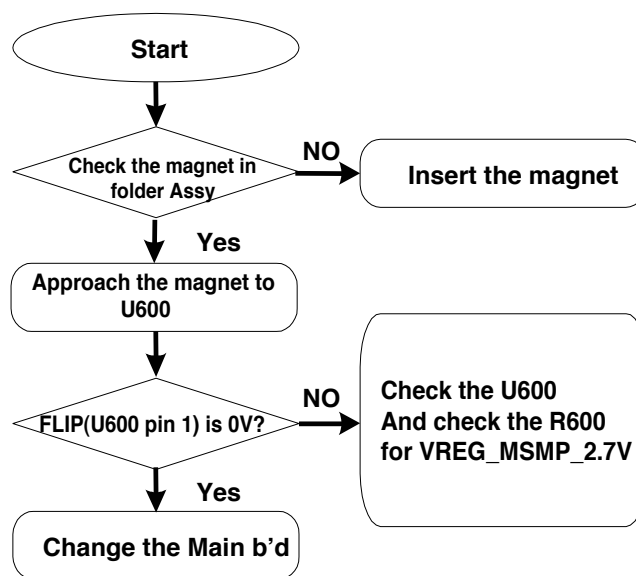


### 4.14 Folder ON/OFF Trouble

Folder On/Off(Close/Open) is worked as below :

Folder On/Off Event -> Flip(U600 pin 1) is triggered(Open : about 2.6V, Close : 0V) -> MSM6250A Sense the Folder Flip Event.

Sensing signal is directly connected to MSM6250A.



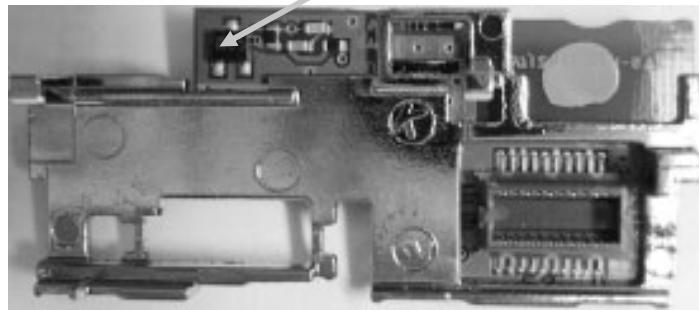
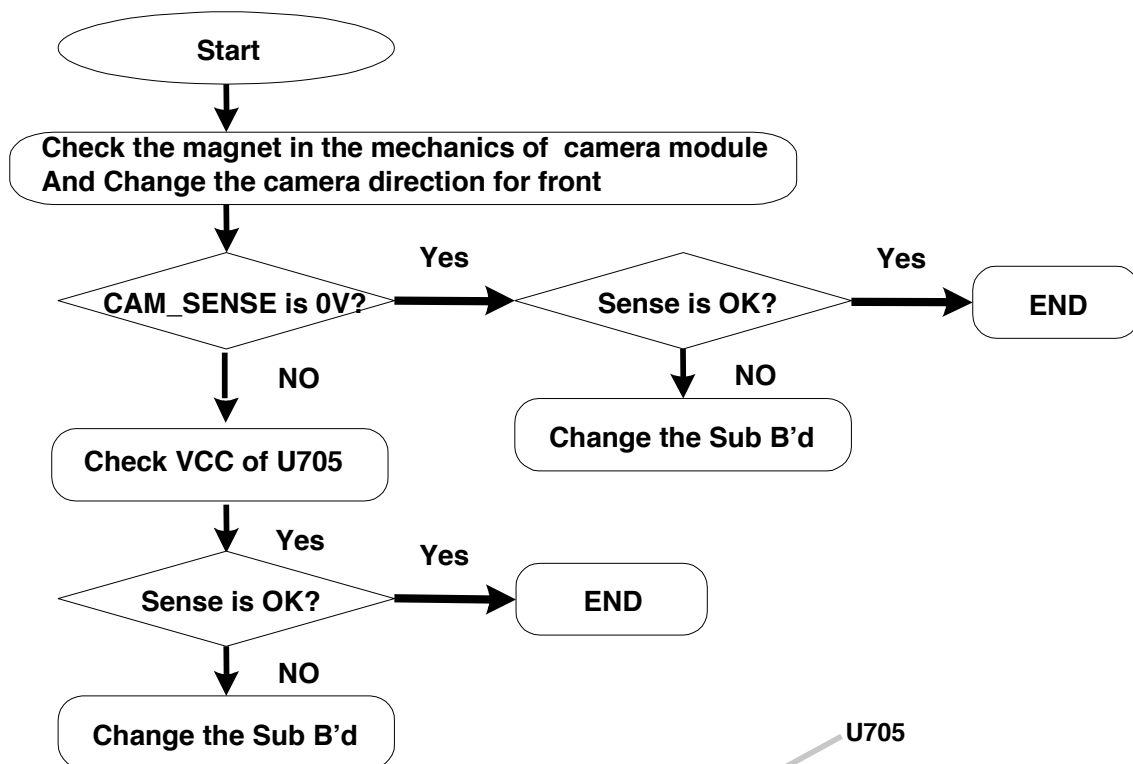


## 4. TROUBLE SHOOTING

### 4.15 Camera Direction Detection Trouble

Camera direction detection is worked as below :

Camera direction change Event -> CAM\_SENSE(U705 pin out) is triggered as this (Cam front side view : 0V, Cam back side view : about 2.5V) -> MSM6250A Sense the Camera direction change Event

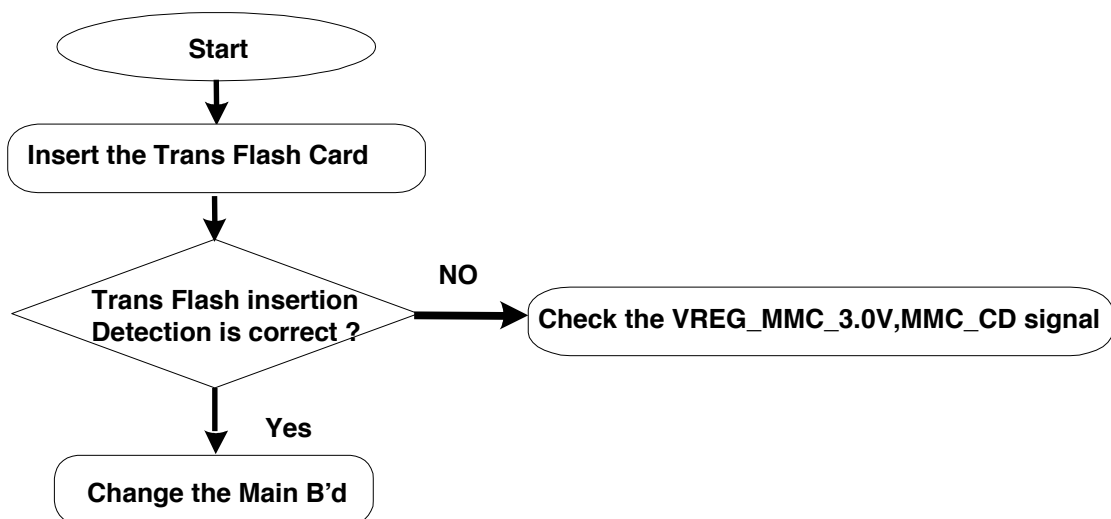


### 4.16 Trans Flash Trouble

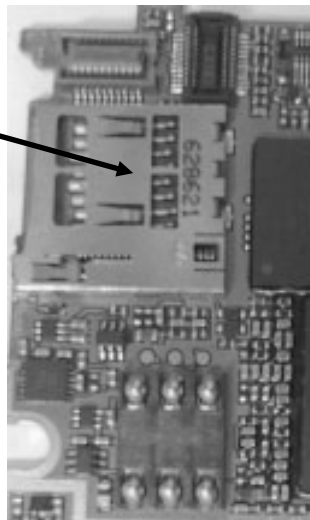
Trans Flash is worked as below :

Trans Flash insertion -> VREG\_MMC\_3.0V is 3.0V -> MMC\_CD go to High ->

Trans Flash Insertion detecting by MSM6250A -> go working



MMC connector



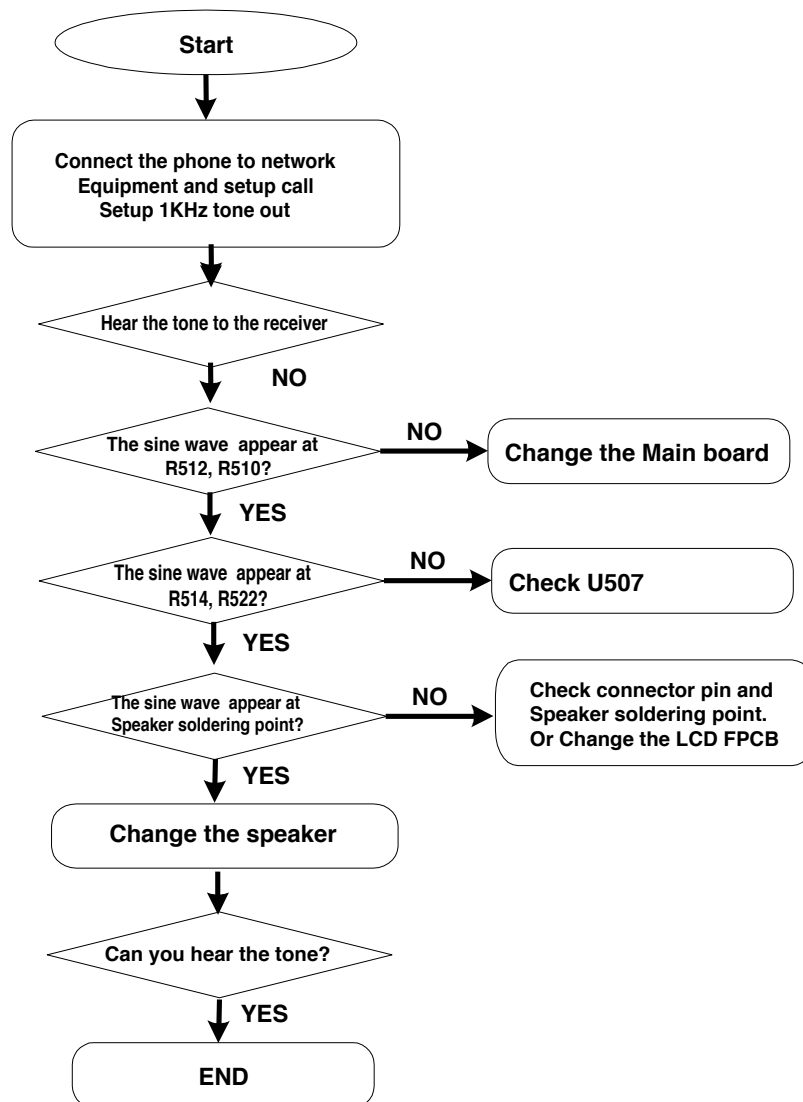
## 4. TROUBLE SHOOTING

### 4.17 Audio Trouble Shooting

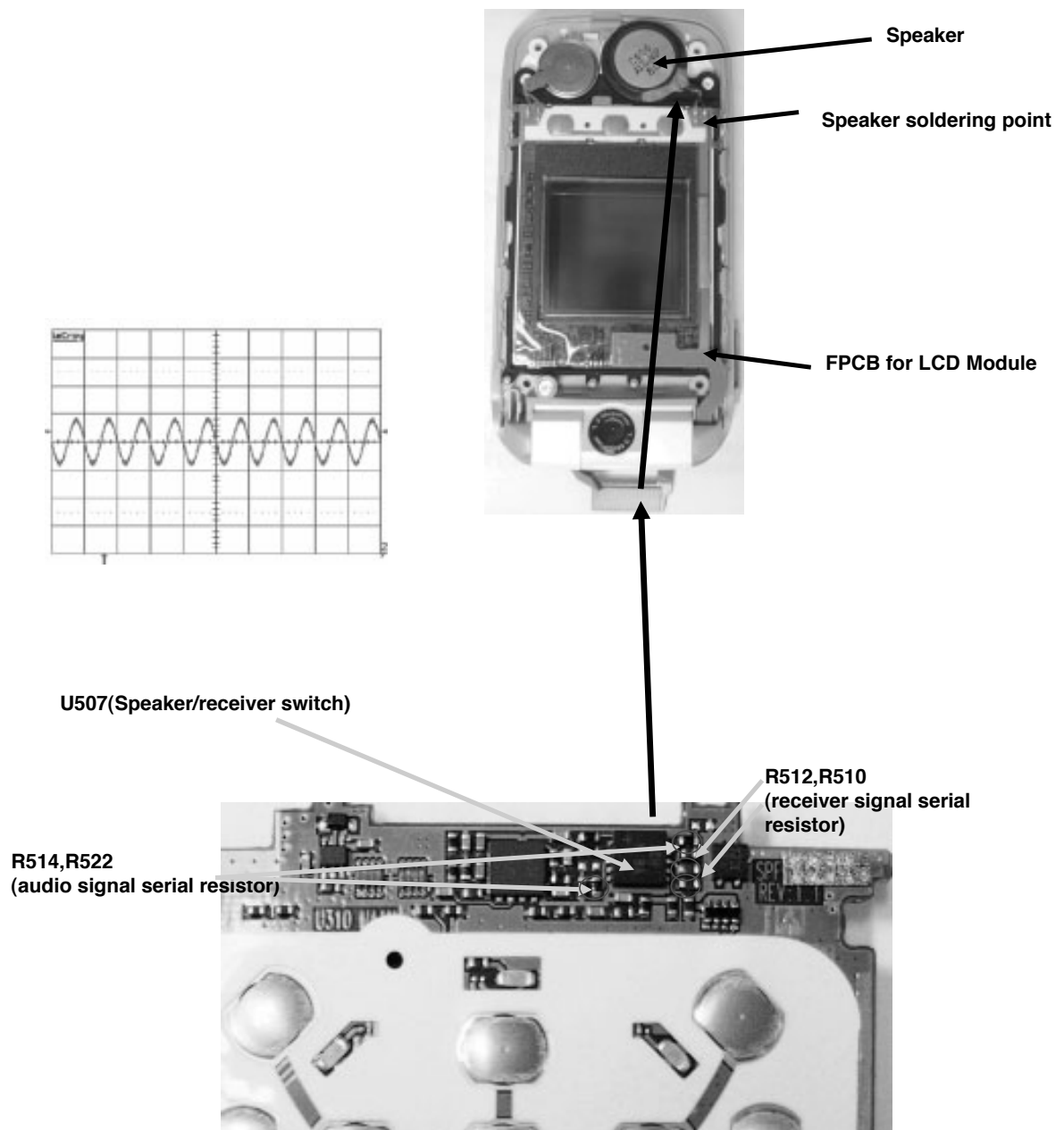
#### 4.17.1 Receiver Path

Voice Receiver path as below:

MSM6250A Ear1ON/Ear1OP -> R512,R510 -> U507(Speaker/receiver switch) ->R514, R522 -> CN602(b'd to b'd connector for LCD Module) -> LCD b'd to b'd connector of LCD FPCB -> LCD module -> Speaker



## 4. TROUBLE SHOOTING



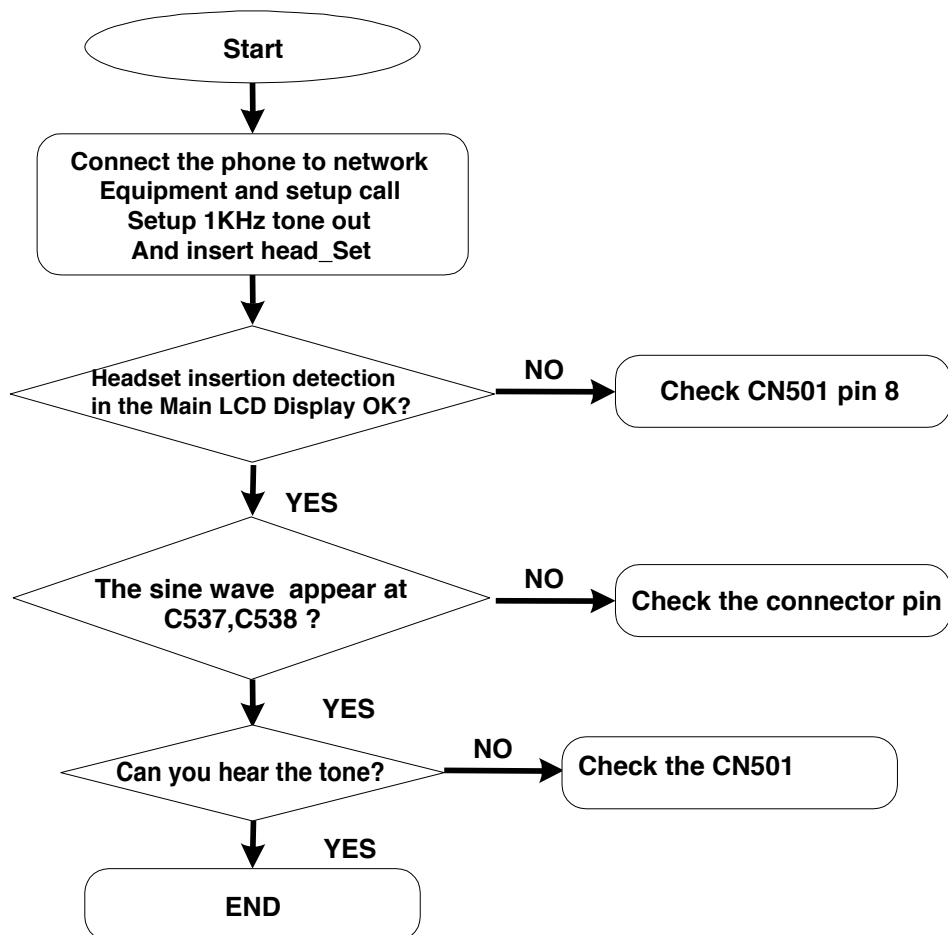
## 4. TROUBLE SHOOTING

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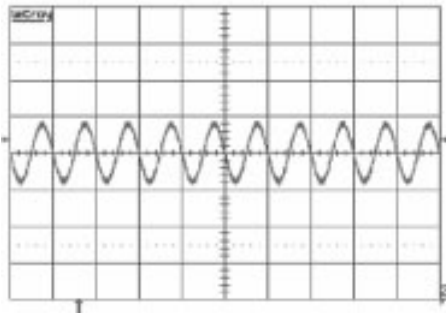
### 4.17.2 Voice and Sound Path for Head\_set

Voice and Multimedia Sound path for Head\_Set as below:

MSM6250A HPH\_R, HPH\_L -> C537, C538 -> R524, R526 -> CN501 headset Jack pin 4,5



## 4. TROUBLE SHOOTING



C537,C538

CN501

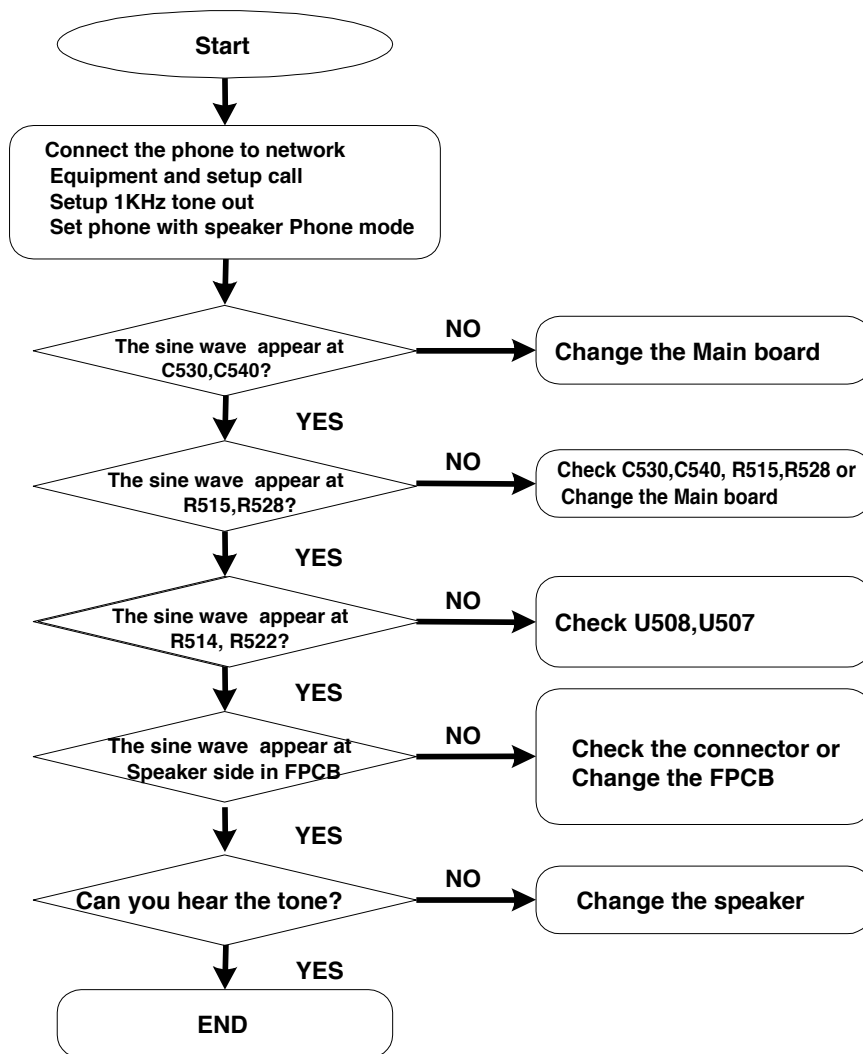
MSM6250A

## 4. TROUBLE SHOOTING

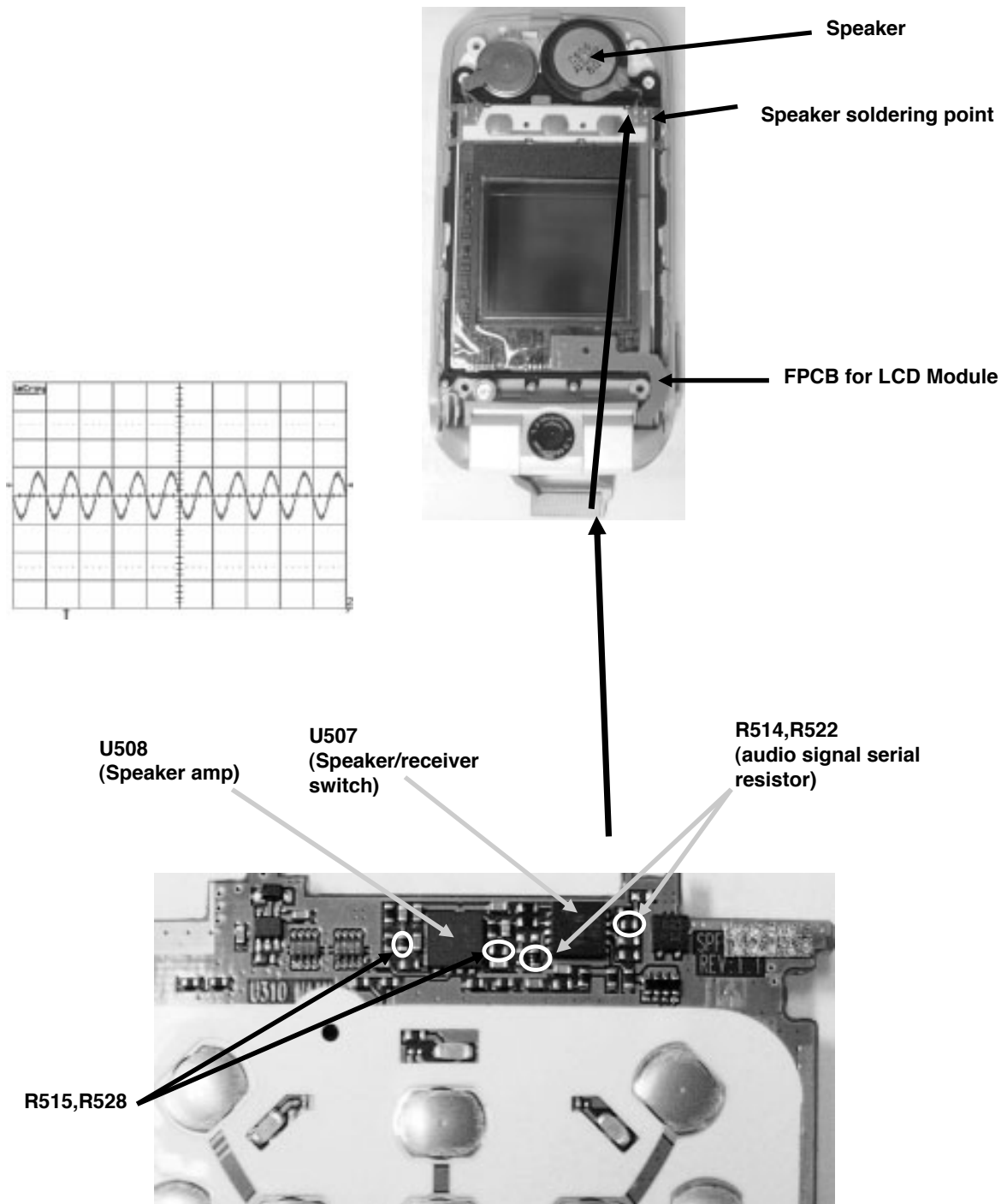
### 4.17.3 Loud Speaker path(voice speaker phone, VT, multimedia play, etc)

Loud speaker path as below:

MSM6250A AUXOP\_AUXOL, AUXOP\_AUXOR -> C530,C540 -> R515,R528 -> U508(amp) -> U507(Receiver/Speaker switch) -> R514, R522 -> CN602 -> LCD FPCB -> Speaker



## 4. TROUBLE SHOOTING



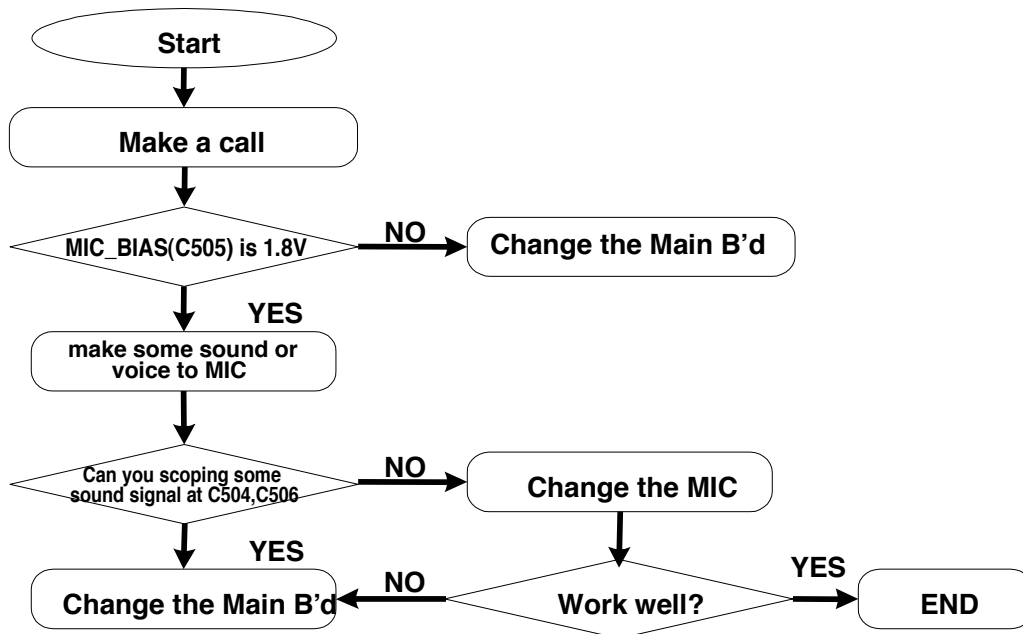
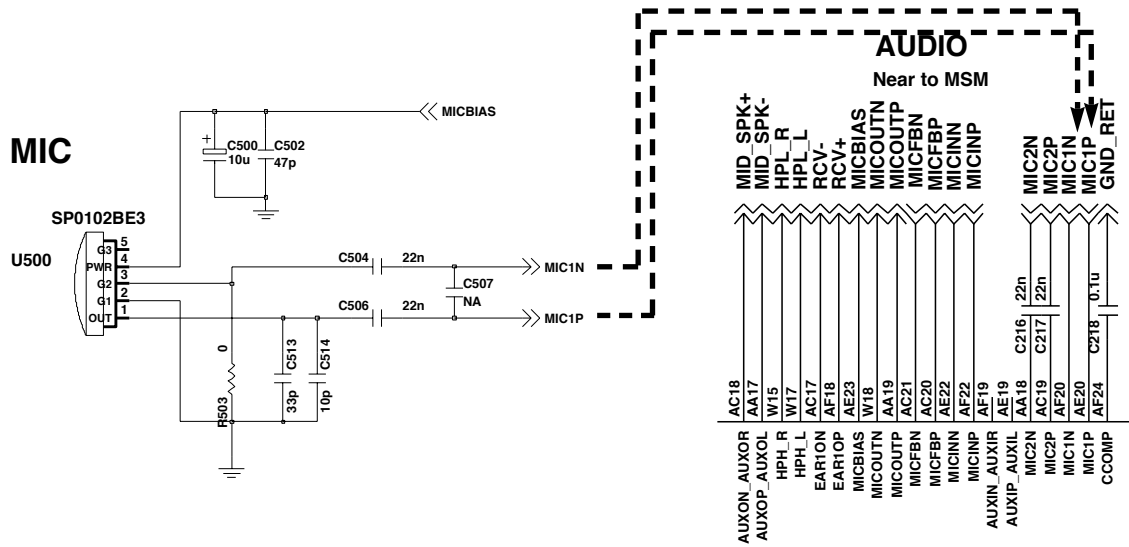


## 4. TROUBLE SHOOTING

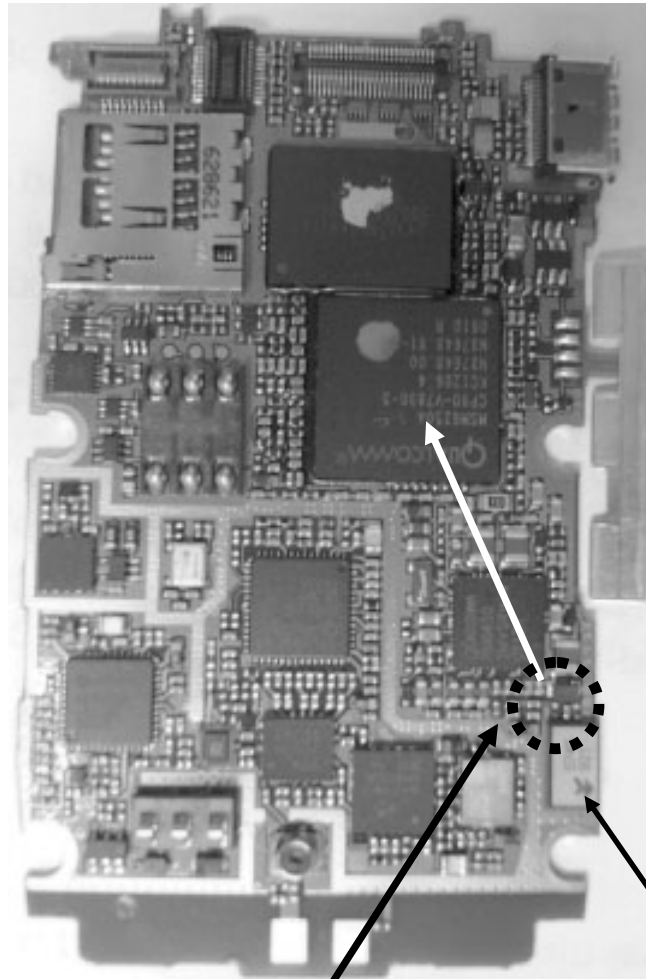
### 4.17.4 Microphone for Main MIC

Main Microphone path as below:

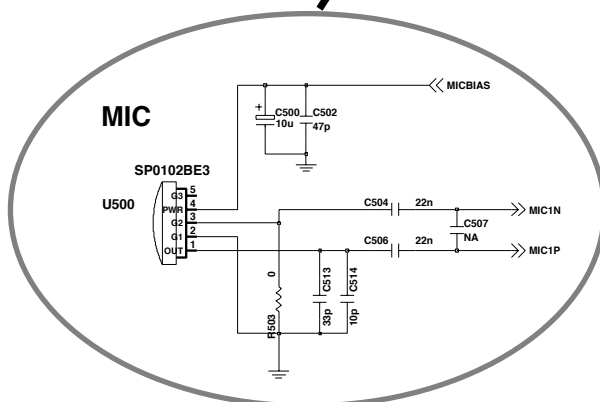
MIC -> C504,C506 -> MSM6250A -> MIC feed back gain logic -> MSM internal CODEC



## 4. TROUBLE SHOOTING



U500(MIC for Handset)



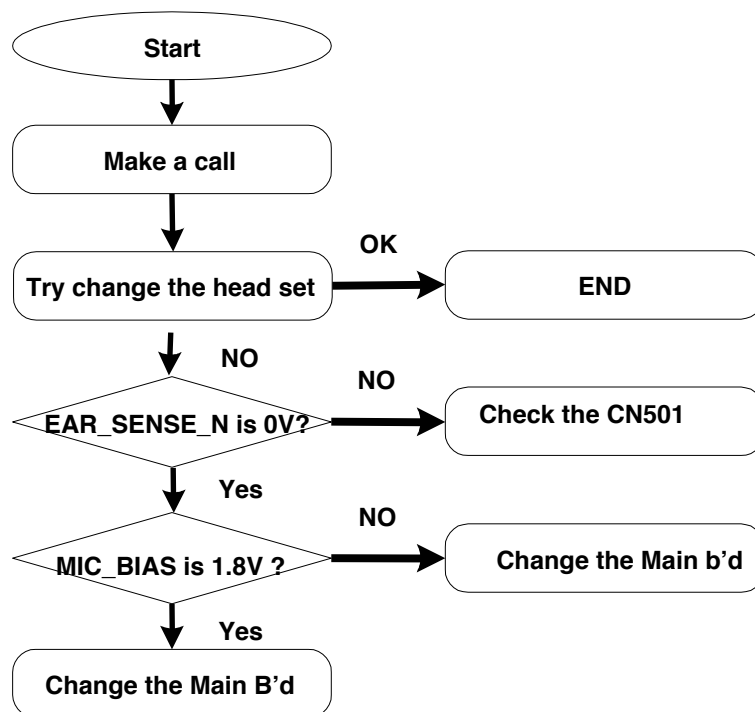
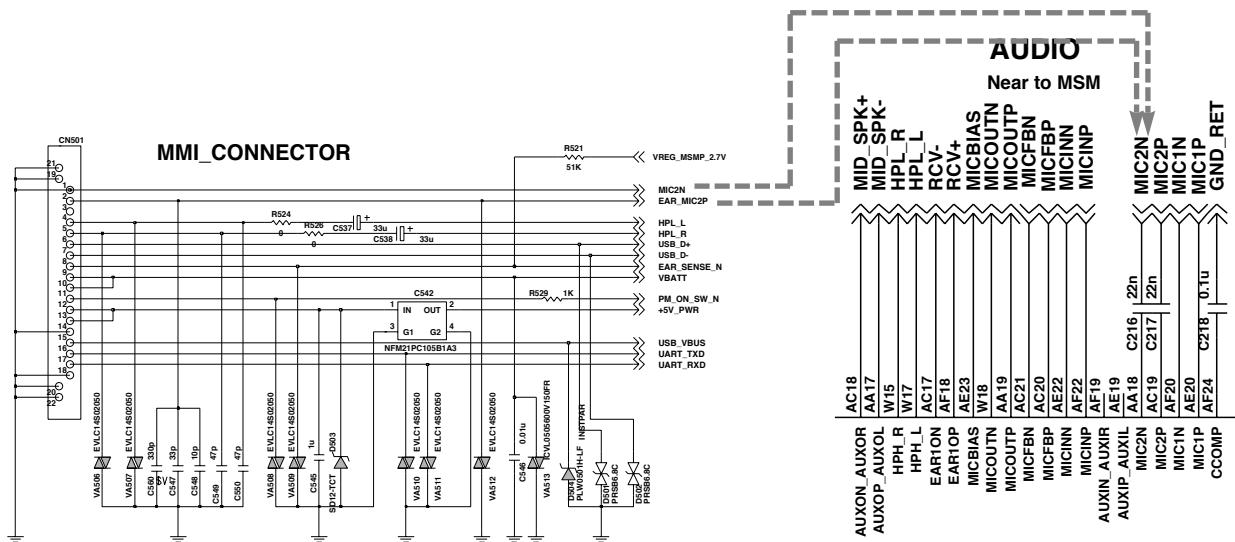
## 4. TROUBLE SHOOTING

### 4.17.5 Microphone for Head\_Set

MIC for Head\_Set path as below:

Insert Headset -> EAR\_SENSE\_N(pin6) go 0V -> MSM6250A sense Head\_Set insertion ->

MIC signal go to MSM(C216, C217) by through b-to-b connector

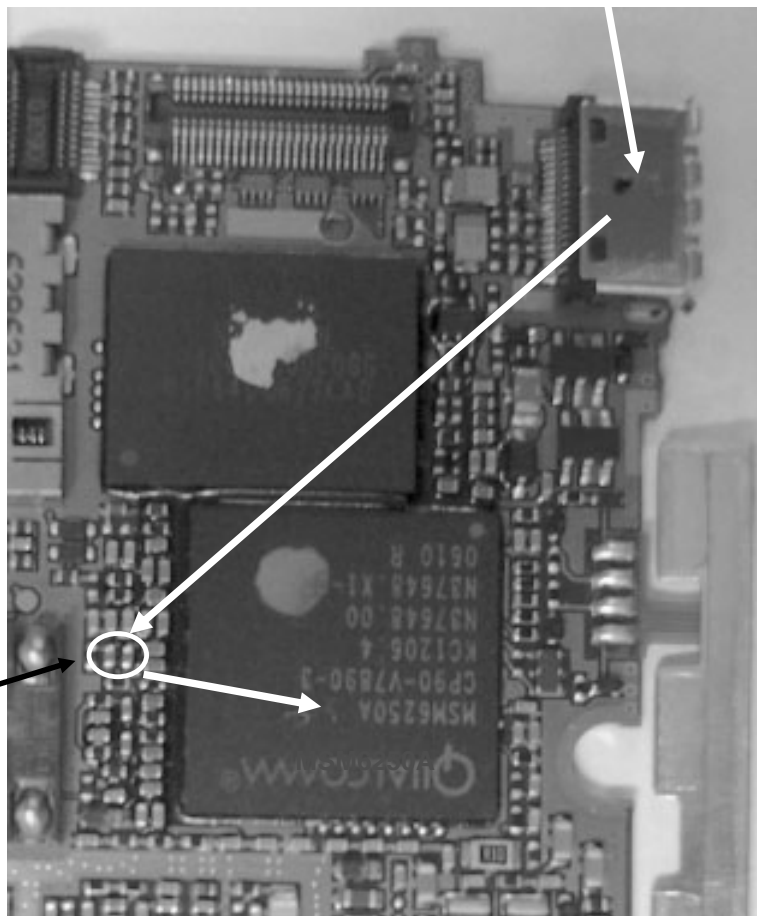


## 4. TROUBLE SHOOTING

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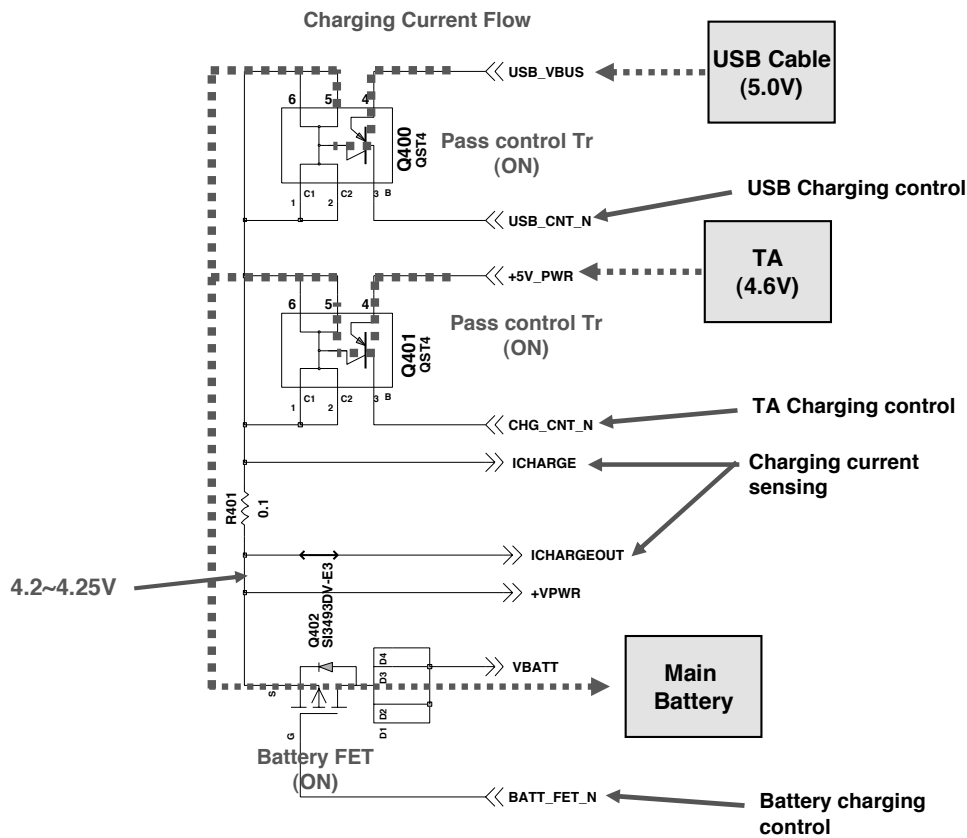


C216,C217 for  
MIC serial capacitor



## 4. TROUBLE SHOOTING

### 4.18 Charger Trouble Shooting



#### Charging Procedure

- Connecting TA or USB Cable
- Control the charging current by PM6050 IC using USB\_CNT\_N or CHG\_CNT\_N signal
- Charging Current flows into the battery by control BATT\_FET\_N

#### Check Point

- Connection of TA or USB Cable
- Charging current path
- Battery

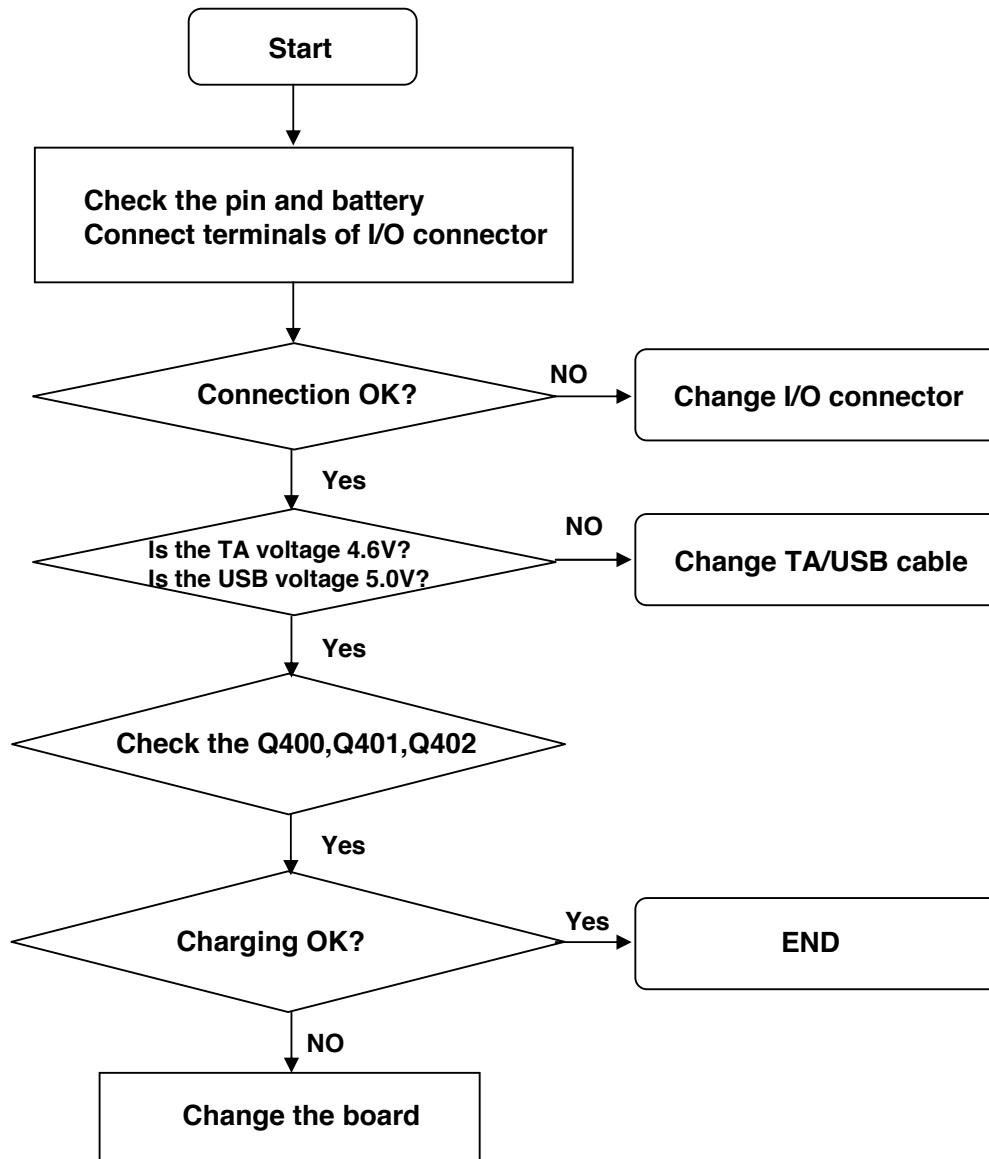
#### Trouble Shooting Setup

- Connect TA or USB Cable and battery to the phone

#### Trouble Shooting Procedure

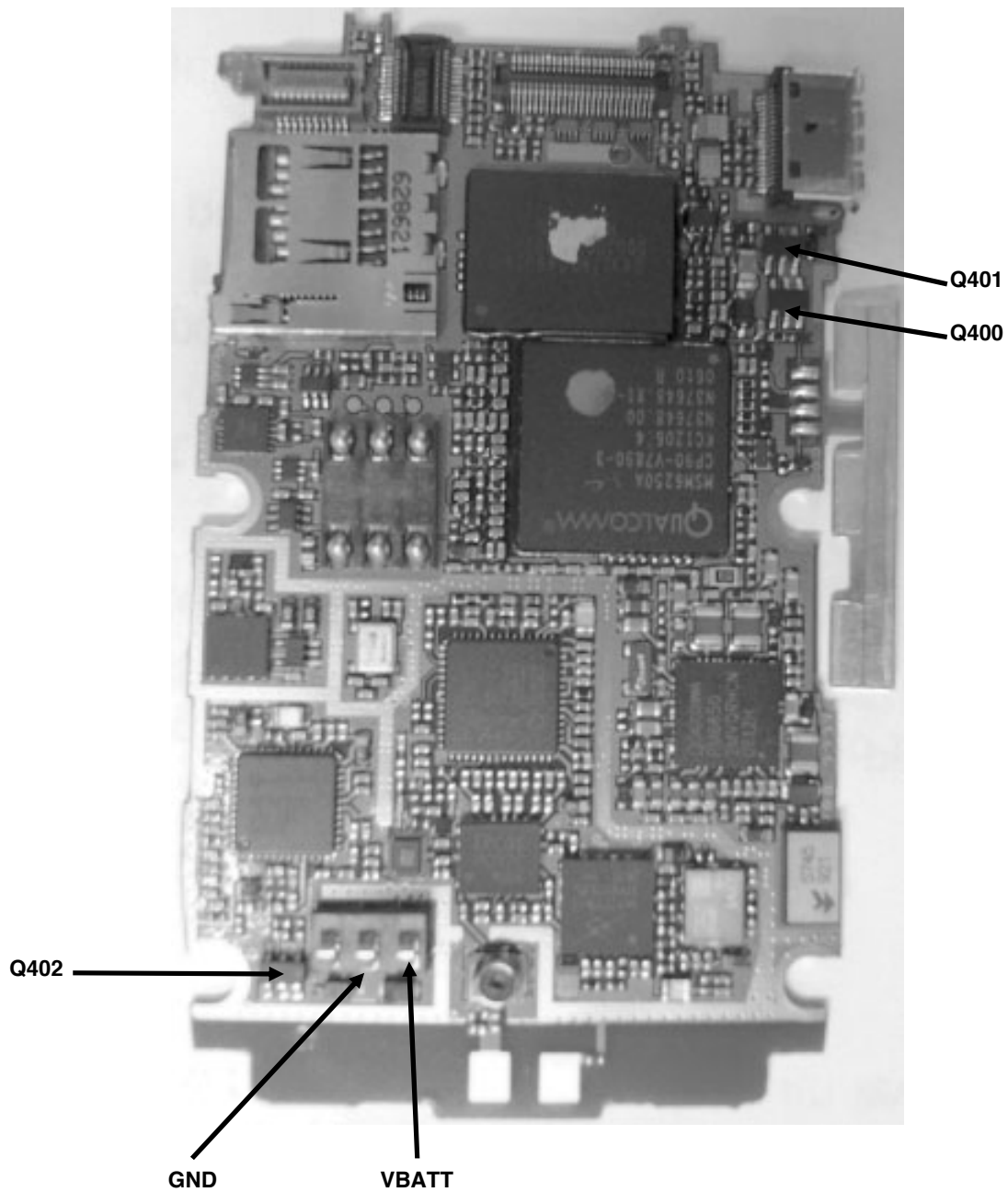
- Check the charger connector
- Check the charging current Path
- Check the battery

## 4. TROUBLE SHOOTING



## 4. TROUBLE SHOOTING

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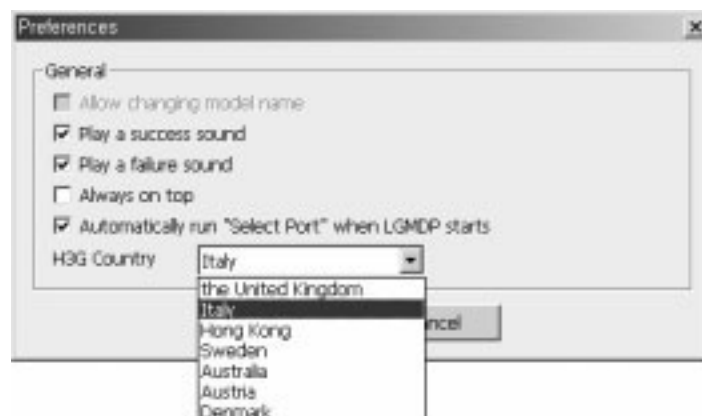
## 5. DOWNLOAD

### 5.1 Introduction

LGMDP is a LGE application that allow users to download images from PC to handset. LGMDP is a download tool with capabilities to upload image files to the handset. LGMDP is designed to be simple to use and easy enough for the beginner to upload executable images to the handset. LGMDP supports Windows 2000/XP where the LG (Ver 4.6 or later) USB modem driver is installed. Additionally, LGMDP allows multi downloading up to 8 handsets at the same time.

### 5.2 Downloading Procedure

- Connect the phone to your desktop PC using the USB cable and run the LGMDP application.  
Before getting started, set up LGMDP preferences from the Preferences of the file menu the way you want. Click on the File menu and select Preferences.
- **Play a success sound**  
It will be played a .wav file when the download has been completed.
- ✕ LGMDP starts, it will automatically select Select Port button to download new image file.
- **Always on Top**  
Check if LGMDP always appears at the top of the window so that user can monitor it all the time.
- **H3G Country**  
Click on the Country box to select from the country list. Make sure that the selected country matches with the binary files to be uploaded to the handset.



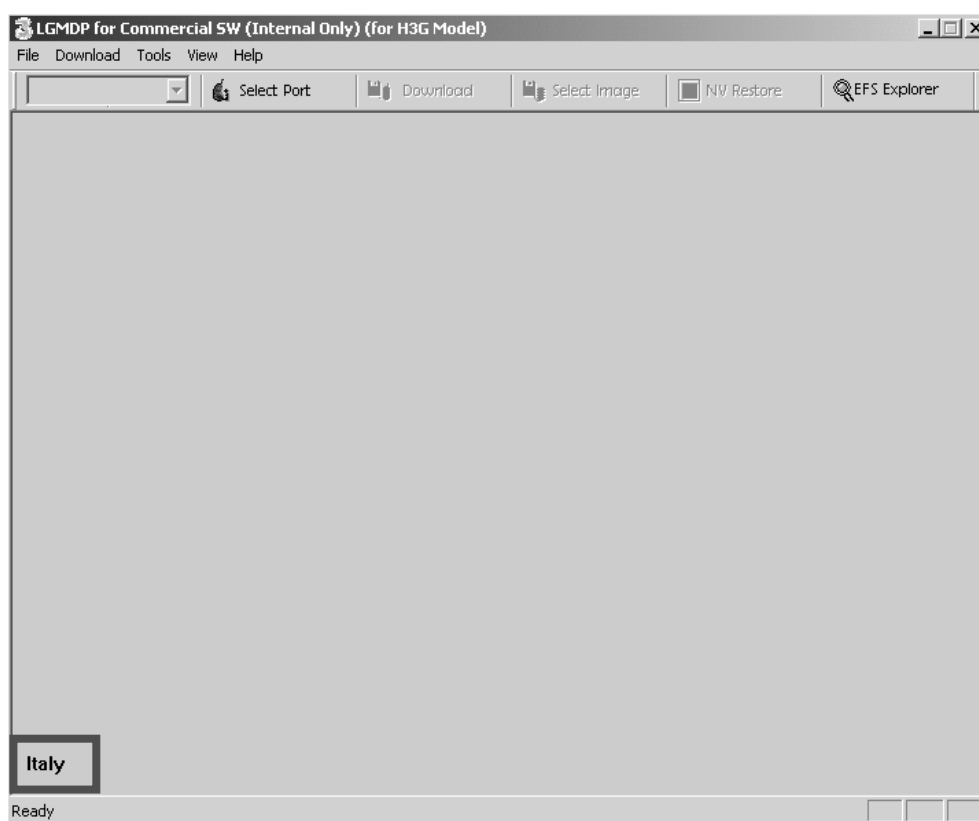


## 5. DOWNLOAD

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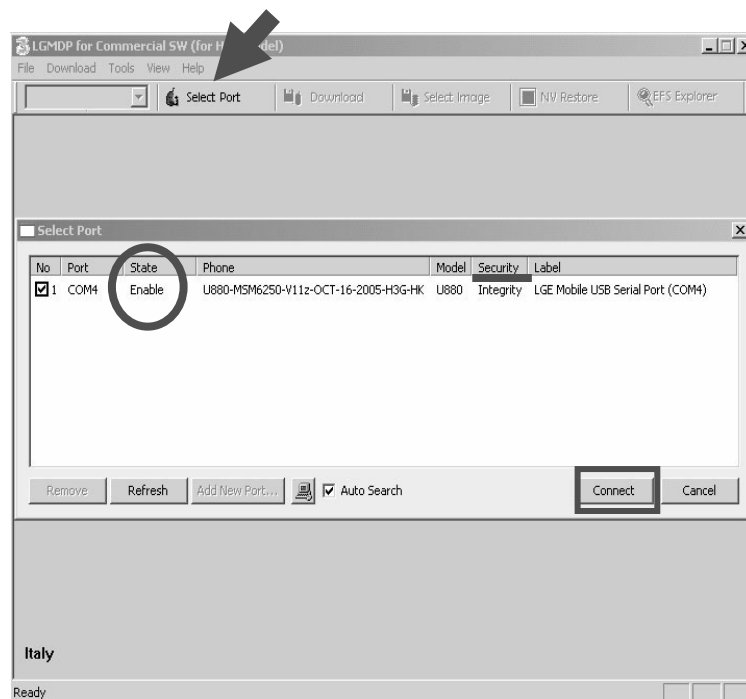
### 5.2.1 Connecting to PC

- Choose desired country and then click on the OK button. Once the desired country is selected, the selected country name will be displayed at the bottom of left corner screen. For instance, if the selected country is “Italy”, then LGMDP will operate based on the Italy Setting Values. In this case, the figure shown in the below will be displayed.



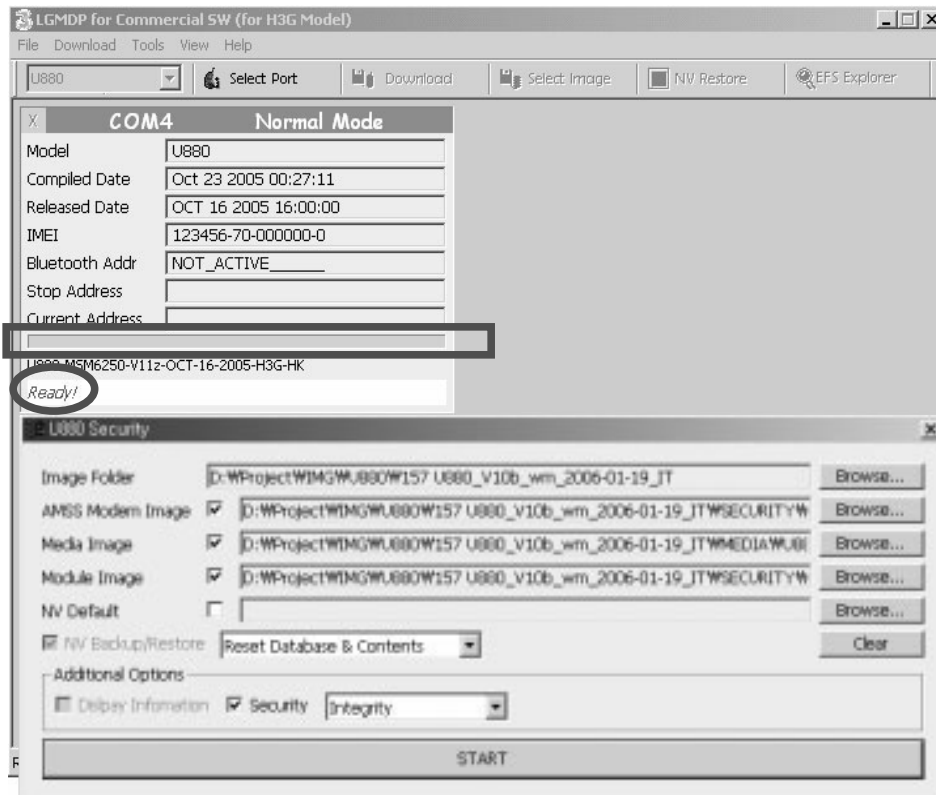
## 5. DOWNLOAD

- Click on the Select Port and then Select Port window will be pop up. Check if state shows Enable for the port to be connected for downloading images. The current security status will be displayed under Security column. Make sure that the selected country is valid. If the selected country is invalid, select the country name again. Integrity is automatically checked for the following country. Italy, United Kingdom, Hong Kong, and Austria. Integrity + Cipherring is checked for Australia, Sweden, and Denmark. Then click on the Connect button.  
(The port number(COM4) shall be different from that of the port number in the snapshot.)



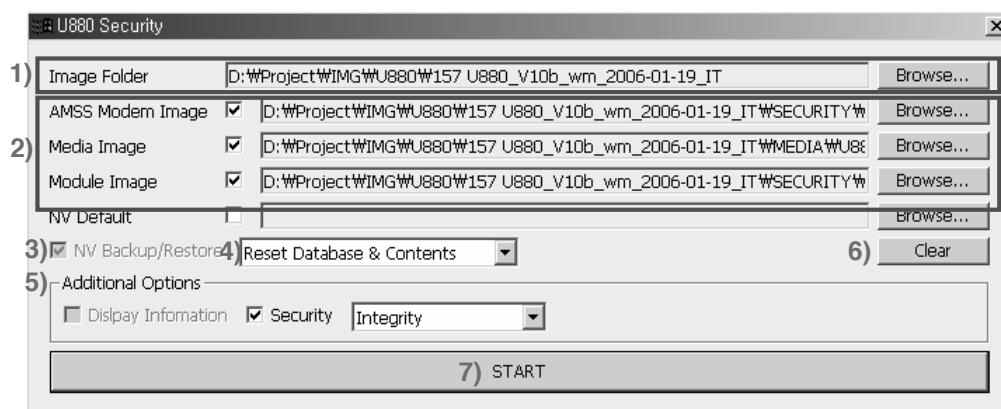
## 5. DOWNLOAD

- The status Ready is displayed when the application is ready for downloading. While the images are transmitted from PC to the handset, a progressive bar (Red box) indicating the degree of transmission of data is displayed.



## 5. DOWNLOAD

- 1) Image Folder indicates loot path where all image files are placed. To change location of the default image path, select Browse... button. The edit box shows the file path where new images are located. Please note that all images should be located in a selected folder.
- 2) Click on the Browse... button to select image files to be downloaded on the handset.
- 3) NV Backup/Restore: NV Backup/Restore always have to be done, and it is default selected option. Backup the NV data and restore the backed up NV data automatically.



#### 4) Reset database & Contents:

User related data including the setting data on the EFS is reset in the handset. The user contents in the handset will be erased. If you want to reset all the user data back to the way they were before you started downloading new images, check the option.

Erase\_EFS:

The calibration data, user contents, media, and module are erased. Only calibration data is kept when NV backup/restore is checked. The user contents and file system physically are wiped out.

Keep All Contents:

Maintain user data including WAP, AD, DRM, Email, Play lists, images when downloading a new images, user data stated above are maintained if this option is enable. (Only For U880 Model)

#### 5) Additional Options:

Display Information is defaultly not selected and user cannot choose.

Security: The security option is automatically selected based on the country when security box is selected.

- Integrity is selected when the selected country is UK, Italy, Hong Kong, Austria, or Israel.
- Ciphering is not applied or used for H3G user.
- Fake Security is not applied or used for H3G user.
- Integrity + Ciphering is selected when the selected country is Australia, Sweden, or Denmark.

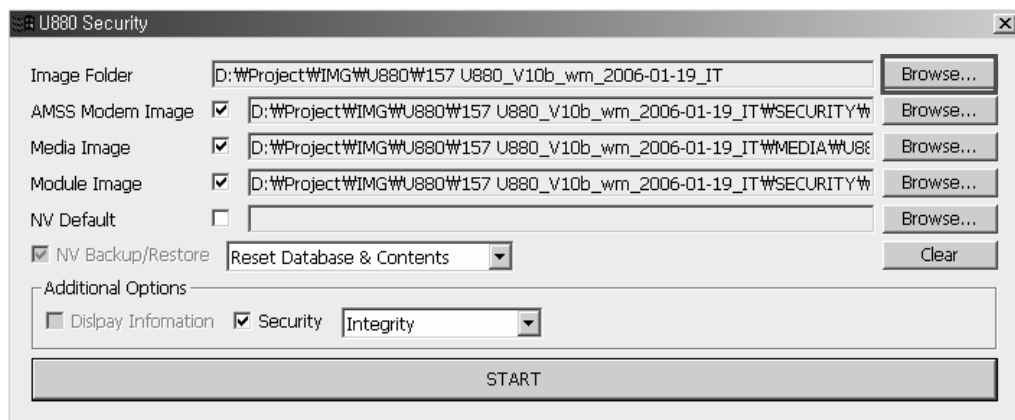
Please note that user cannot select the options stated above on the security

## 5. DOWNLOAD

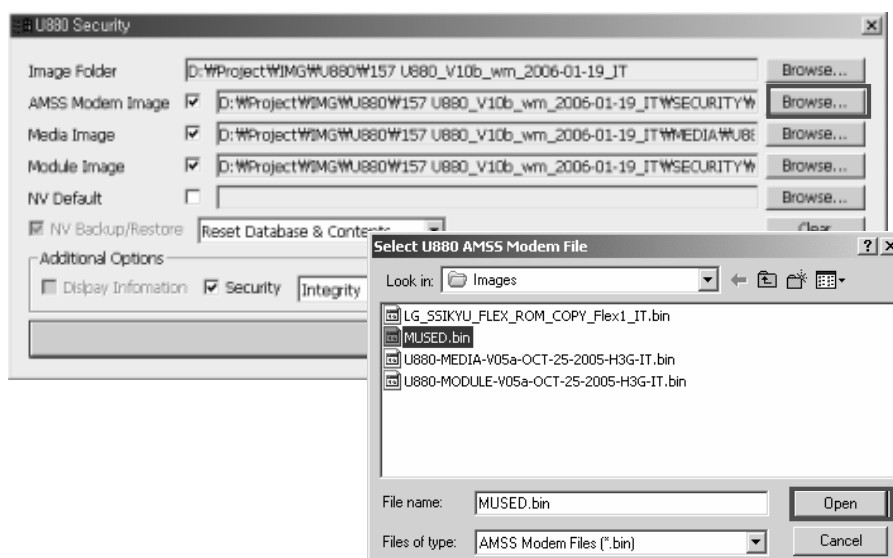
- 6) Clear: Clearing all directory paths of images in the dialog.
- 7) Start: Starting downloading the selected individual image.

### 5.2.2 Choosing image files

- Select the image folder, where all the image files are located, by clicking on the Browse.... (The folder name shall be different from that of the folder name in the snapshot. The folder name indicates the path where the image files are located.)

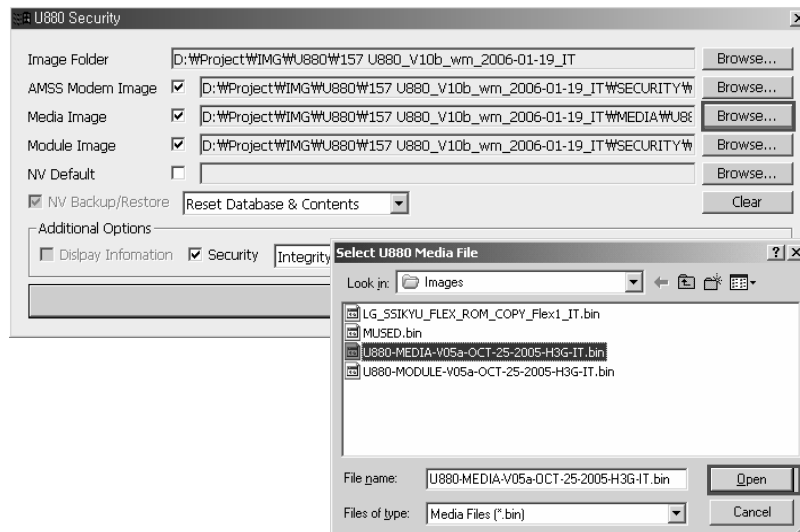


- Select the path, where AMSS Modem image file is located by clicking on the Browse... button. The selected AMSS image will be downloaded to the handset from the path directory in the PC. Make sure that you have chosen correct file. In case of wrong AMSS Modem file is selected, the phone may not work. (The file name shall be different from that of the file name in the snapshot.)

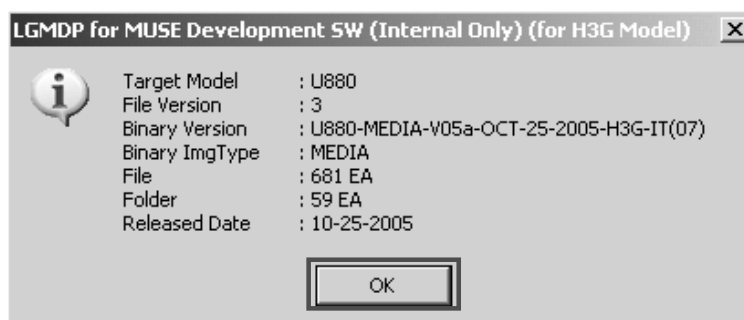


## 5. DOWNLOAD

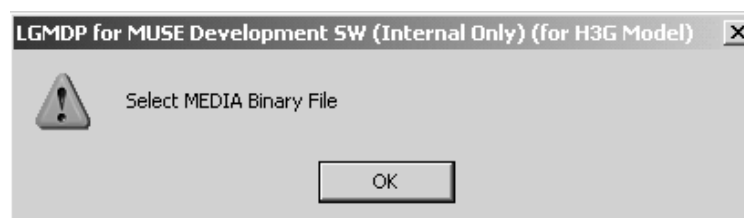
- Select the path, where Media Image file is located by clicking on the Browse... button. The selected Media image will be downloaded to the handset from the path directory in the PC. Make sure that you have chosen the right media image file.



- After selecting an image, a prompt will be displayed asking whether user want to download the selected image. Confirm the information on the message box.

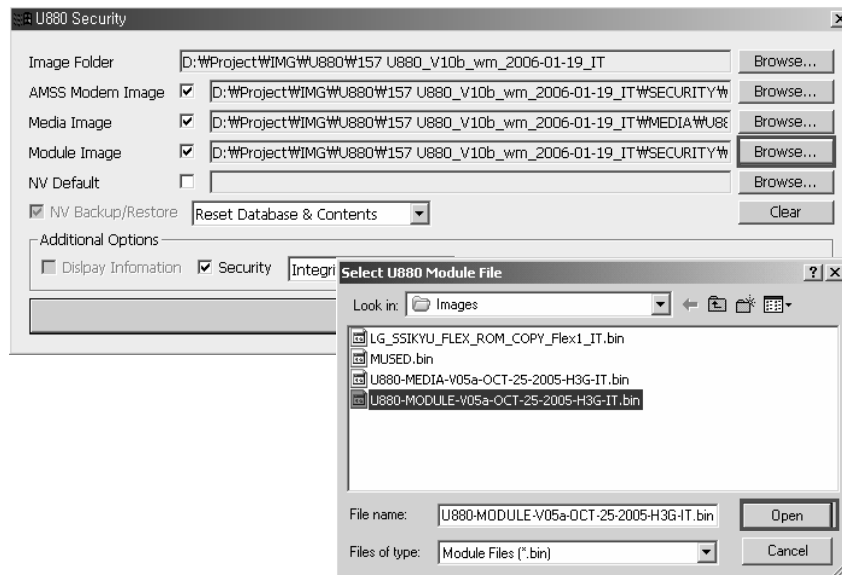


- Caution) Application will popup Error message if you choose improper file.

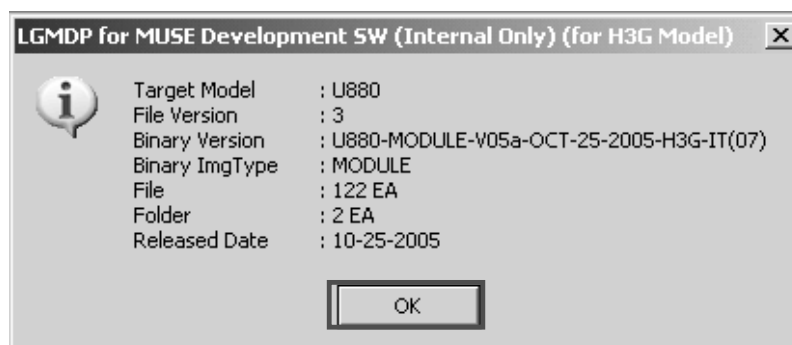


## 5. DOWNLOAD

- Choose a Module Image file after clicking on the Browse... button. The selected Module image will be downloaded to the handset from the path directory in the PC. Make sure that you have chosen the right Module image file.



- After selecting an image, a prompt will be displayed asking whether user want to download the selected image. Confirm the information on the message box.

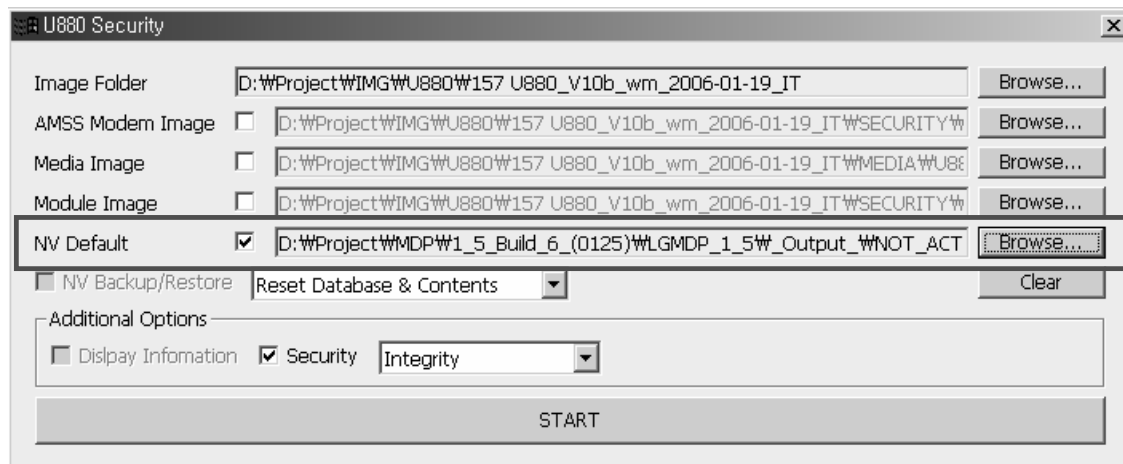


- Caution) Application will popup Error message if you choose improper file.

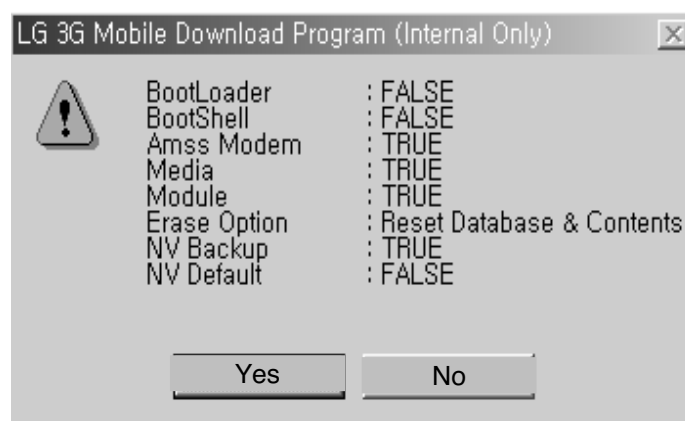


## 5. DOWNLOAD

- If NV restore is failed, then the NV Data(\*.nv2) is erased permanently. In this case, choose the desired NV file to be downloaded on the handset. To enable this simply check the box or select the NV file from the LGMDP installation directory by clicking on the Browse... button.



- Click on the START button to start downloading. A summary of the selected images and option information window will be displayed. Click on the No button if this is not the setting you are downloading for. Otherwise click on the Yes button to continue downloading selected image file with options.

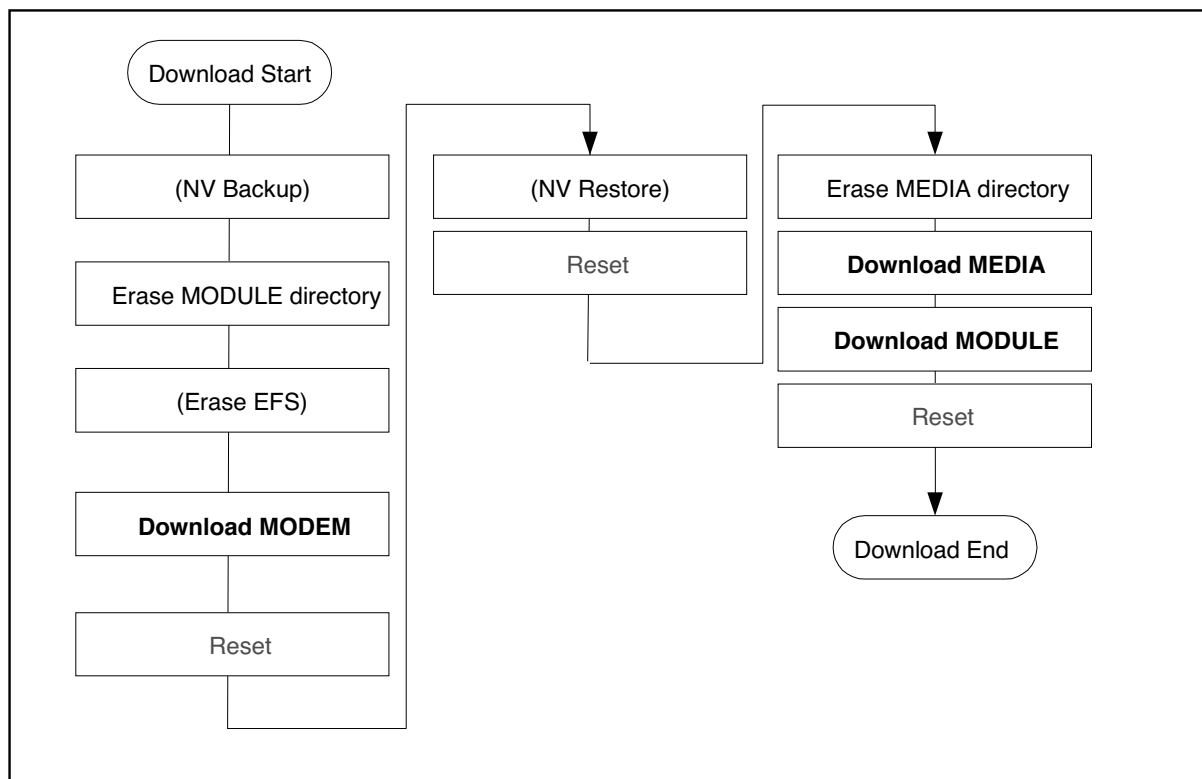




## 5. DOWNLOAD

### 5.2.3 Downloading

- The following flow chart is whole process for downloading images to the handset. You will see snapshots for each step in the succeeding slides.

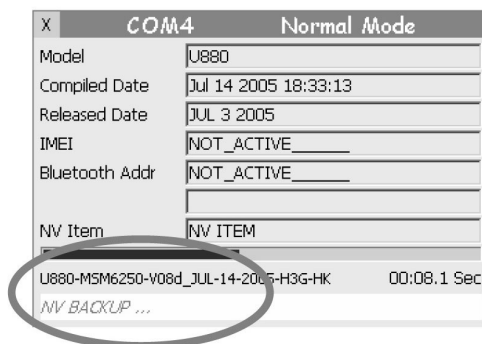


<Download process>

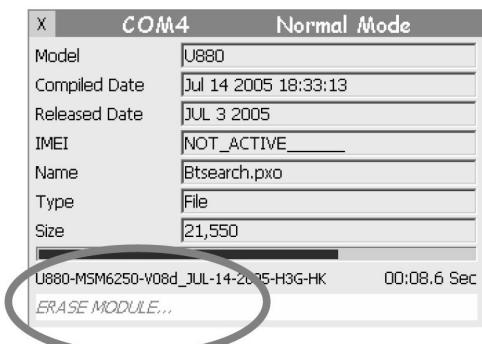
## 5. DOWNLOAD



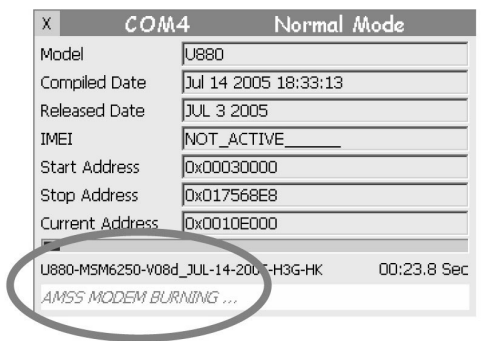
- This message box informs that a new file for NV backup will be created in the displayed file name in the LGMDP installation directory.



- Backing up NV data and backed up NV data will be stored in the LGMDP installation directory.



- Erasing the existing directories and files before the Module image is downloaded.

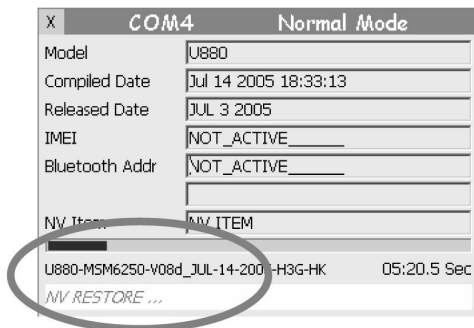


- Downloading the AMSS modem image

## 5. DOWNLOAD



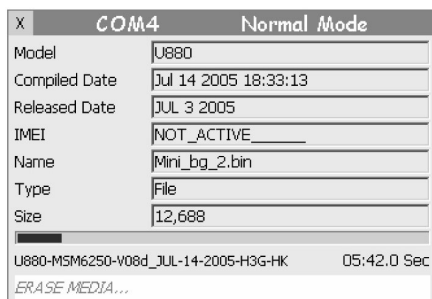
- Rebooting the handset and re-establishing the connection



- Restoring NV data which backed up in the Backing up process. User can also restore NV data using NV Default image selection.



- Rebooting the handset and re-establishing the connection



- Erasing the existing directories and files before downloading the selected Media image

## 5. DOWNLOAD

X	COM4	Normal Mode
Model	U880	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Name	Hair_5.bin	
Type	File	
Size	7,168/7,452	
U880-MSM6250-V08d_JUL-14-2005-H3G-HK		00:53.8 Sec
MEDIA DOWNLOADING ...		

- Downloading Media image in progress

X	COM4	Normal Mode
Model	U880	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Name	CommonComposer.pxo	
Type	File	
Size	100,864/163,798	
U880-MSM6250-V08d_JUL-14-2005-H3G-HK		15:04.1 Sec
MODULE DOWNLOADING ...		

- Downloading Module image in progress

X	COM4	Download End
Model	U880	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Bluetooth Addr	NOT_ACTIVE_____	
Stop Address		
Current Address		
U880-MSM6250-V08d_JUL-14-2005-H3G-HK		19:08.3 Sec
Download Completed!		

- Downloading process has completed successfully

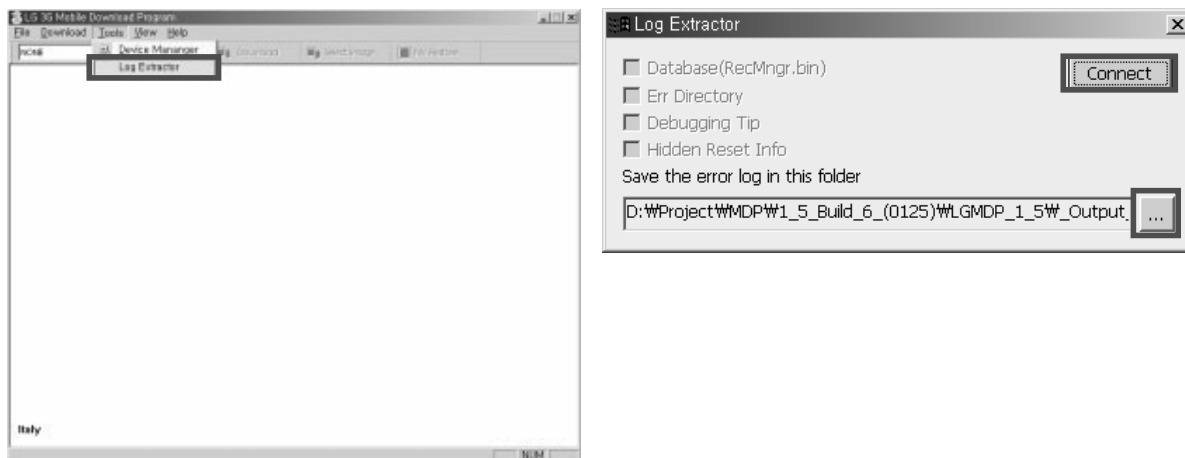
## 5. DOWNLOAD

### 5.2.4 Tools

- Device Manager allows to monitor current hardware that is installed on your PC. Device Manager is designed to monitor USB connectivity and check where the COM has been installed . Select Device Manager from the Tools of the file menu.



- Log Extractor is designed to extract log information from handset and store log related files in the selected root path in PC. This function is very useful for debugging. Select Log Extractor from the Tools of the file menu, and connect the phone with LGMDP by clicking on the Connect button. When clicking on the Connect button, this checks if the appropriate files such as LGAPP/RecMngr.bin, err directory, Debugging\_Tip.txt, or Hidden\_info.bin are placed on the handset. If they exist, then appropriate check boxes are checked accordingly. Select directory to store log files by clicking on the ... button.



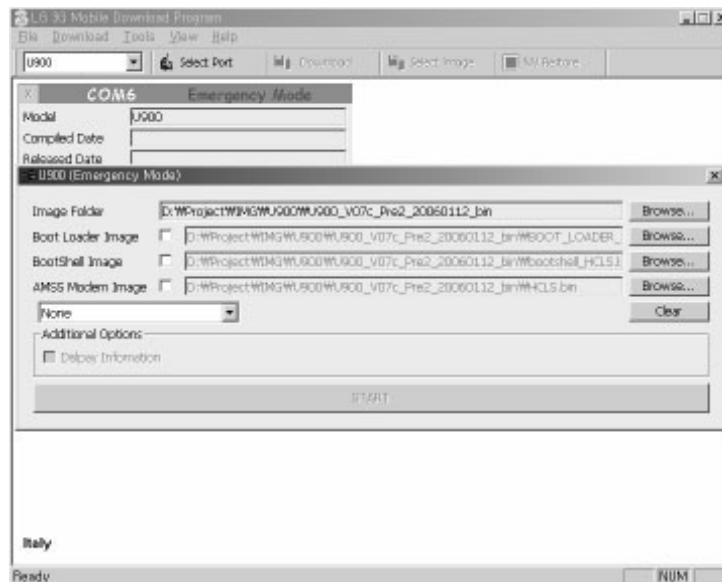
- 1) When the phone does not work after downloading has been completed.
- 2) Media Erasing Error
- 3) NV Restore Error

- Reboot the phone in the emergency mode (Simultaneously press 2, 5, and PWR red keys) and then try to download all the images again including AMSS modem, Media, and Module image.
- The phone supports a special mode called emergency mode. In this mode, minimum units for downloading is running so that users can download the images again in case of emergency situation. (AMSS modem, Media, and Module images can not be running in this mode.)
- The below dialog shows parameters of Select Port when phone is booted in Emergency mode. Click on the Connect button to continue.



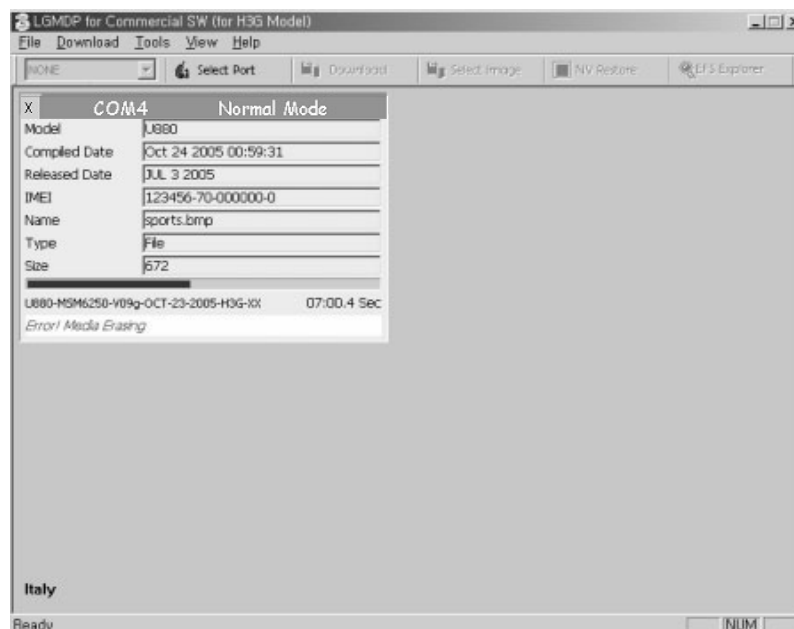
## 5. DOWNLOAD

- Choose Image file after clicking on the Browse... button. Make sure that you have chosen the right image file. After choosing valid images, then click on the Start button to start downloading selected images. The selected image will be downloaded to the handset from the path directory in the PC. After downloading images successfully, it will boot to normal mode.



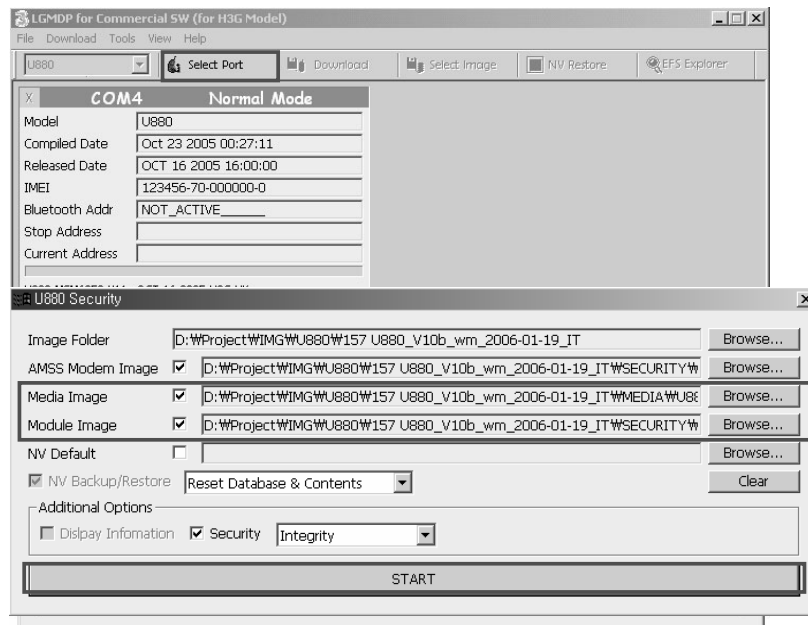
### 5.3.2 Media Erasing Error

- Snapshot showing the MEDIA Erasing error before downloading the Media image. Next slide shows the remedial procedure to adopt.



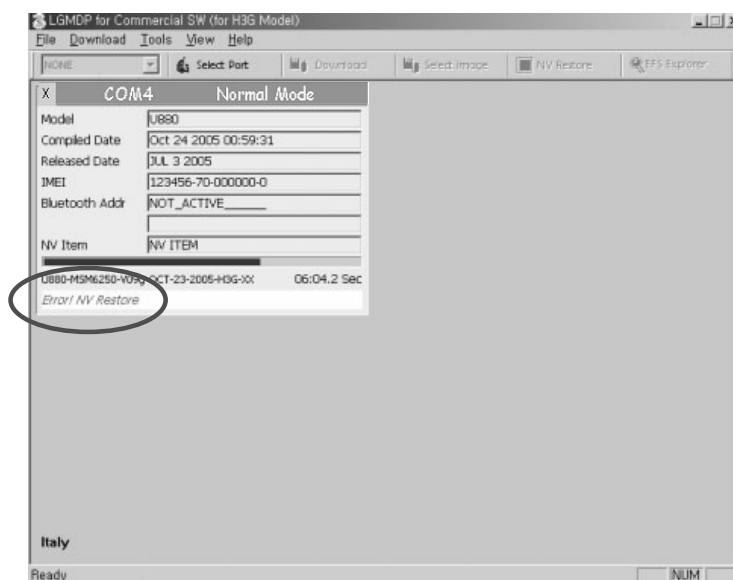
## 5. DOWNLOAD

- Reboot the phone and then re- try to download only the Media and Module images again. Both Media and Module image have to be downloaded at the same time.



### 5.3.3 NV Restore Error

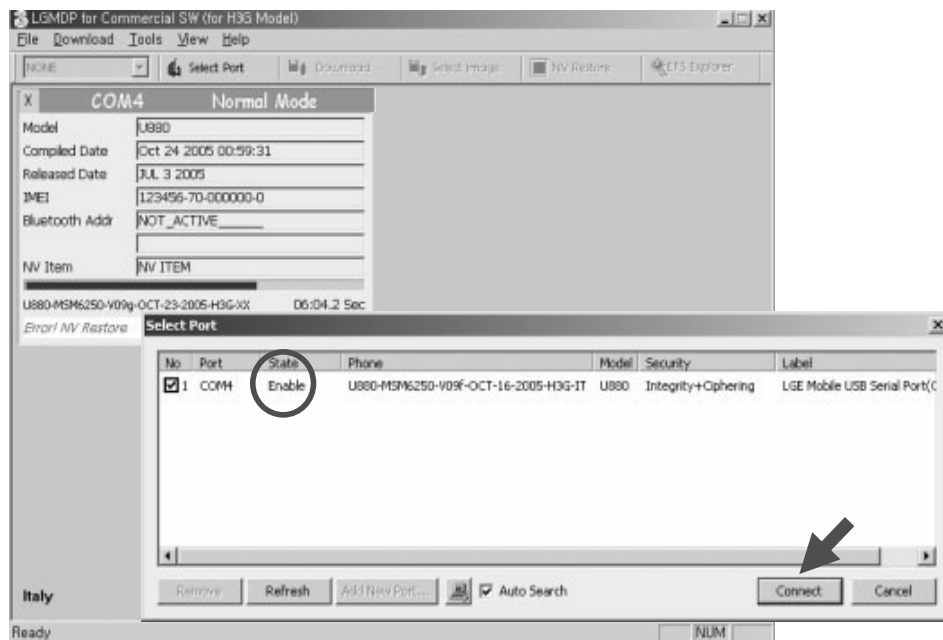
- Snapshot showing the NV Restore error. Next slide shows the remedial procedure to adopt.



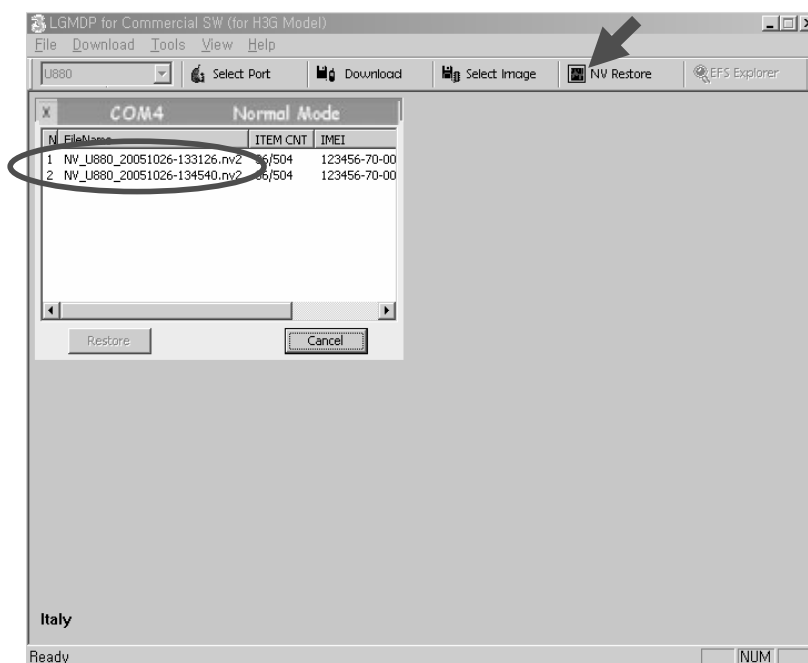


## 5. DOWNLOAD

- Connect the handset and Press the Connect button in the Select Port window. (Enable state in the window indicates that the Phone has been detected and is ready to download.)

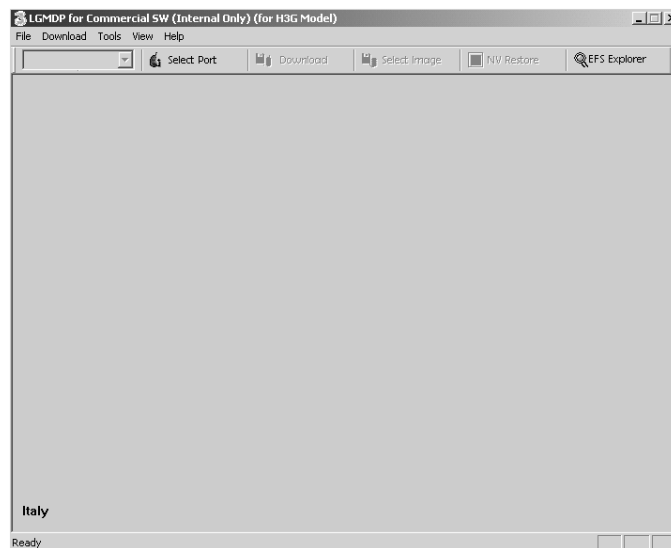


- Click on NV Restore. A list of NV Backup files(\*.nv2) will be shown. These files were saved every time NV Backup option was selected. The name is determined based on the time when NV Backup was done.

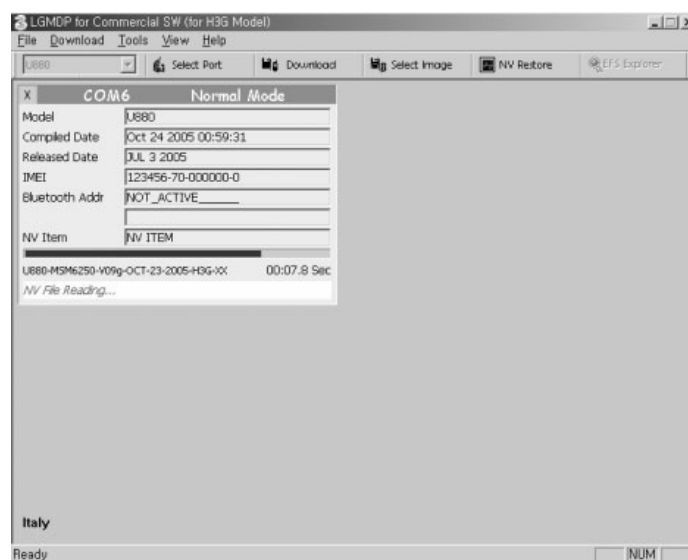


## 5. DOWNLOAD

- Choose the desired NV file to be downloaded on the handset, and click on Restore.



- Snapshot showing the error, Reading the NV file and restore NV.



## **5. DOWNLOAD**

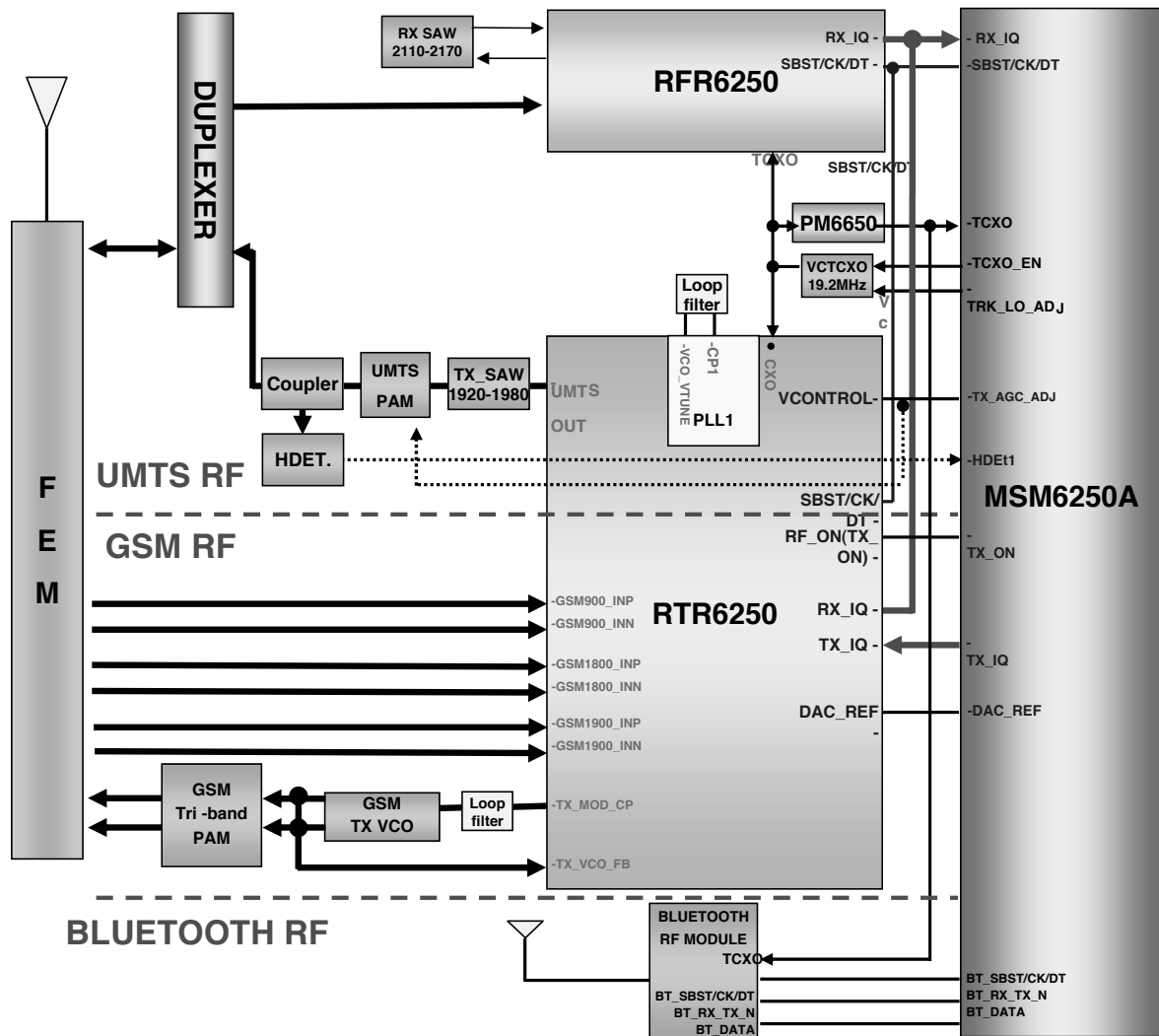
---

### **5.4 Caution**

- 1) Not recommended that multi-downloading using the USB hub.**
- 2) Recommended that the Module and Media Image have to be downloaded at the same time.**
- 3) Erase EFS option will erase everything (media, module, nv items, and user data) in the EFS area.**

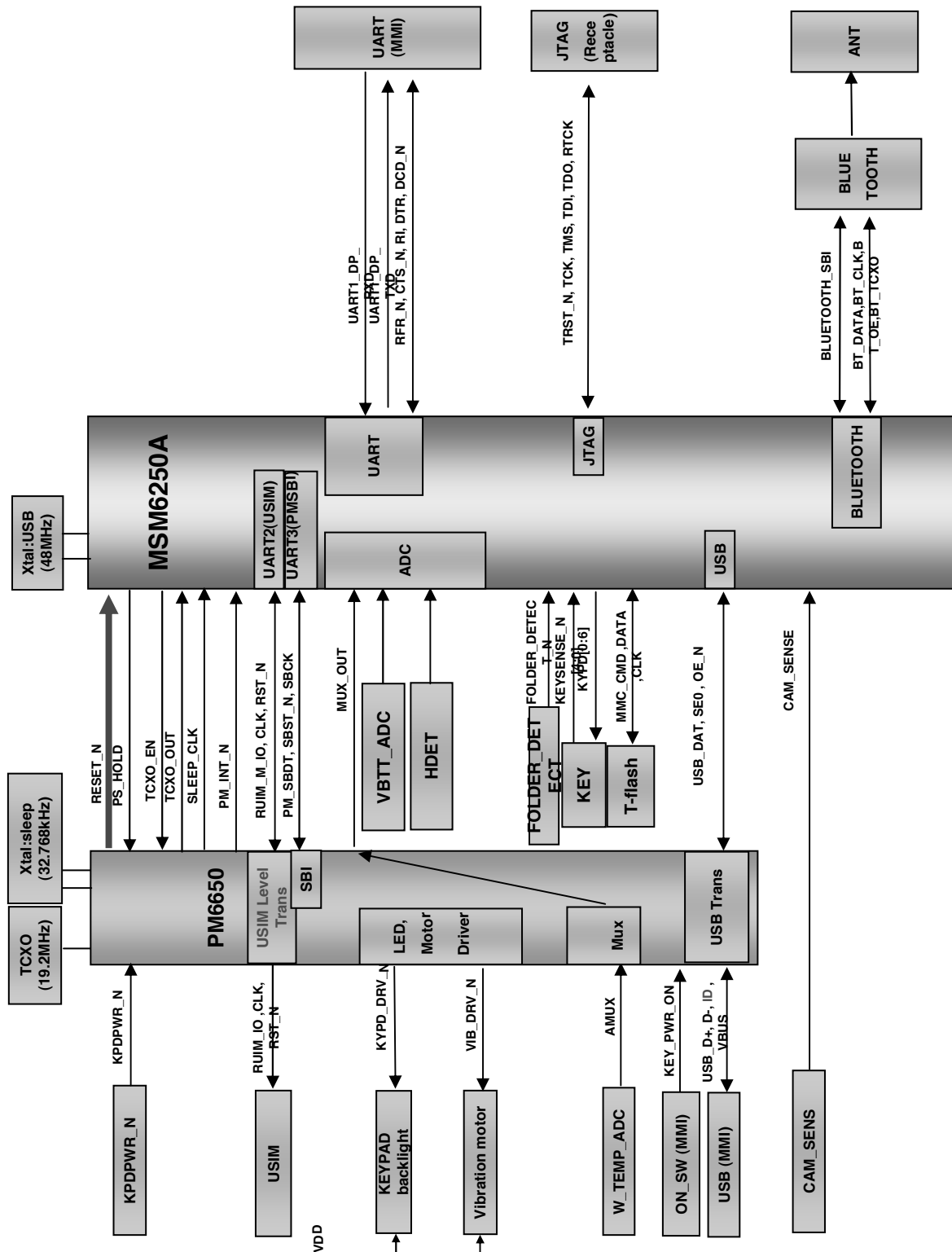
## 6. BLOCK DIAGRAM

## 6.1 GSM &amp; WCDMA RF Block

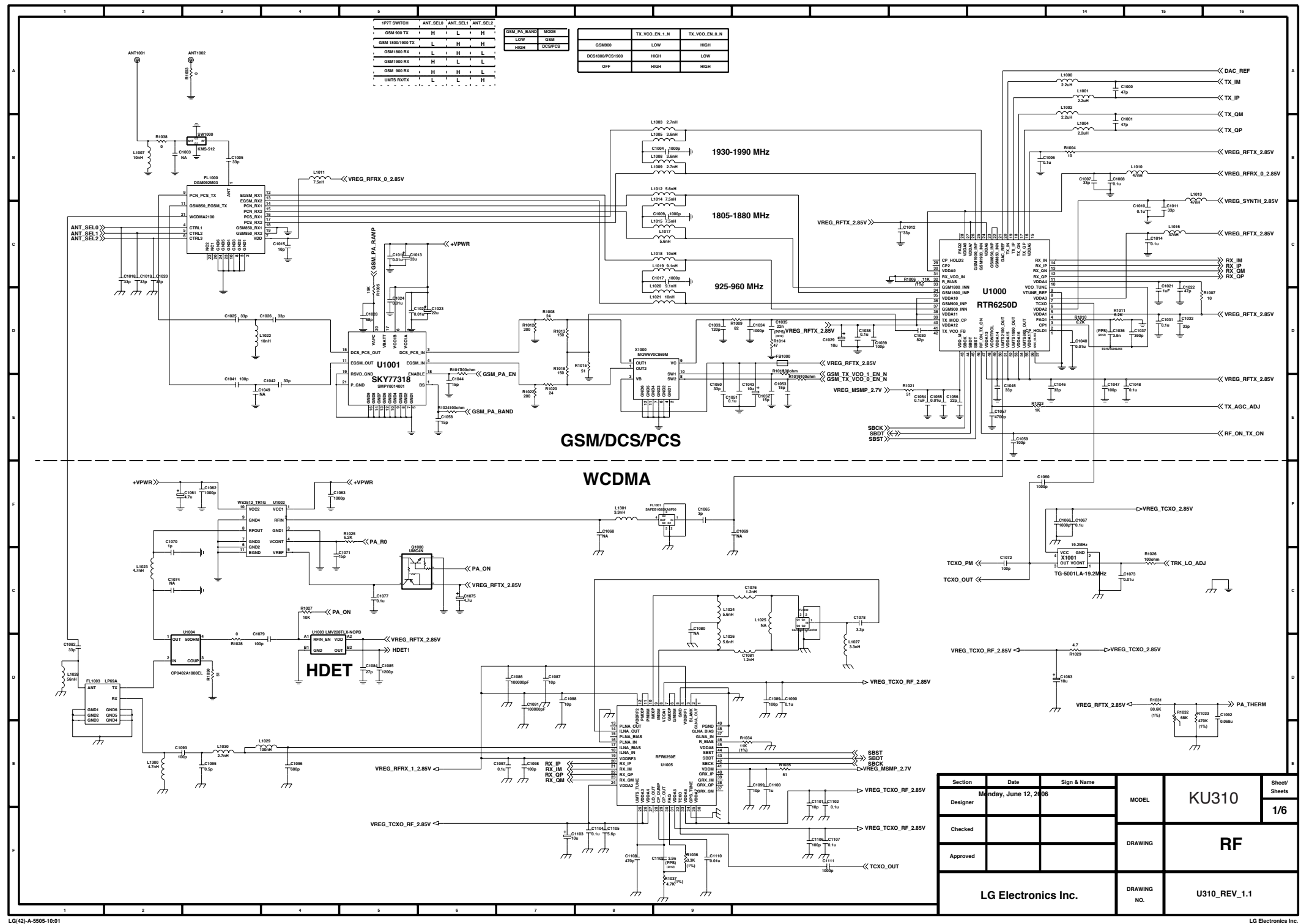


## 6. BLOCK DIAGRAM

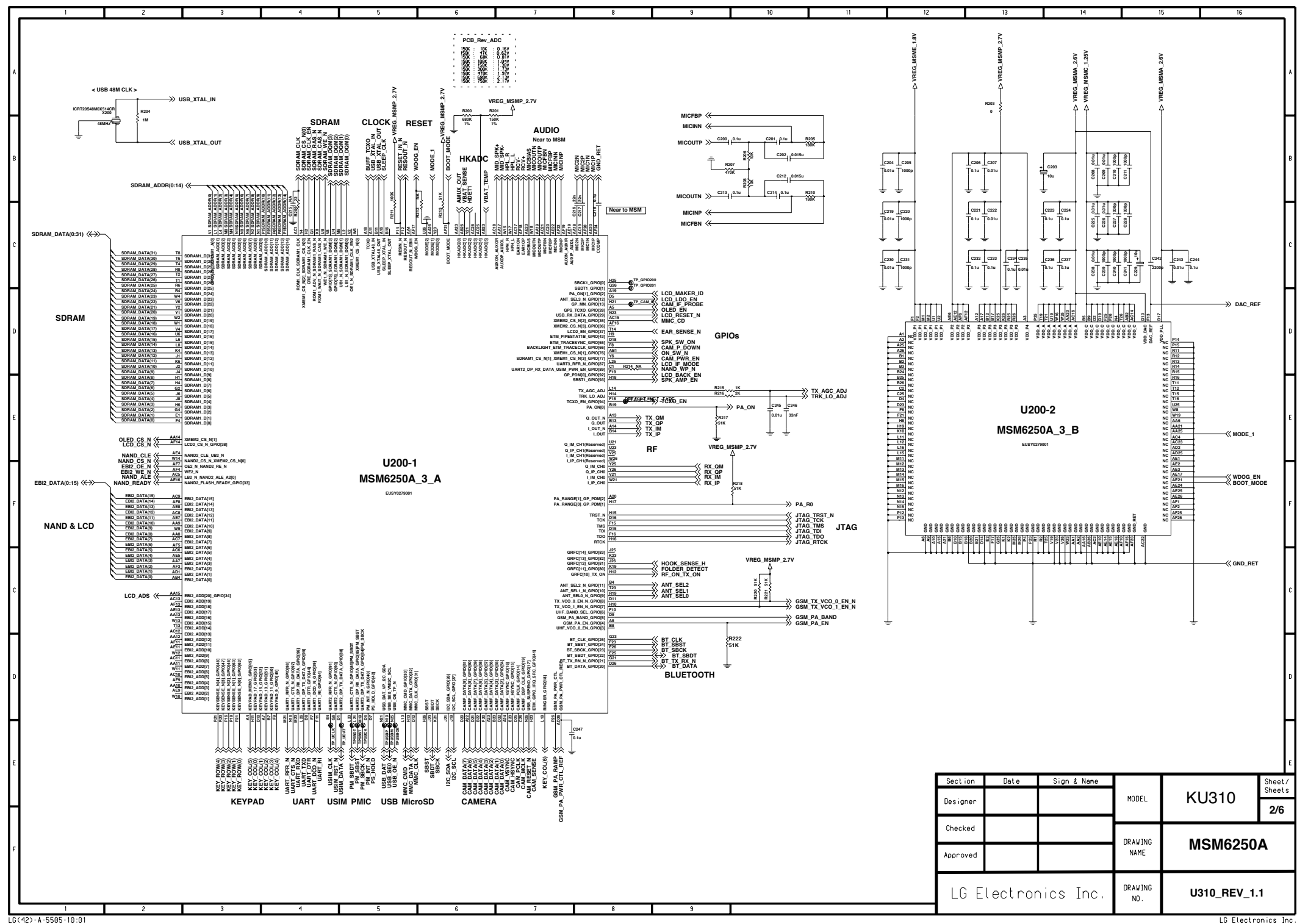
### 6.2 Interface Diagram



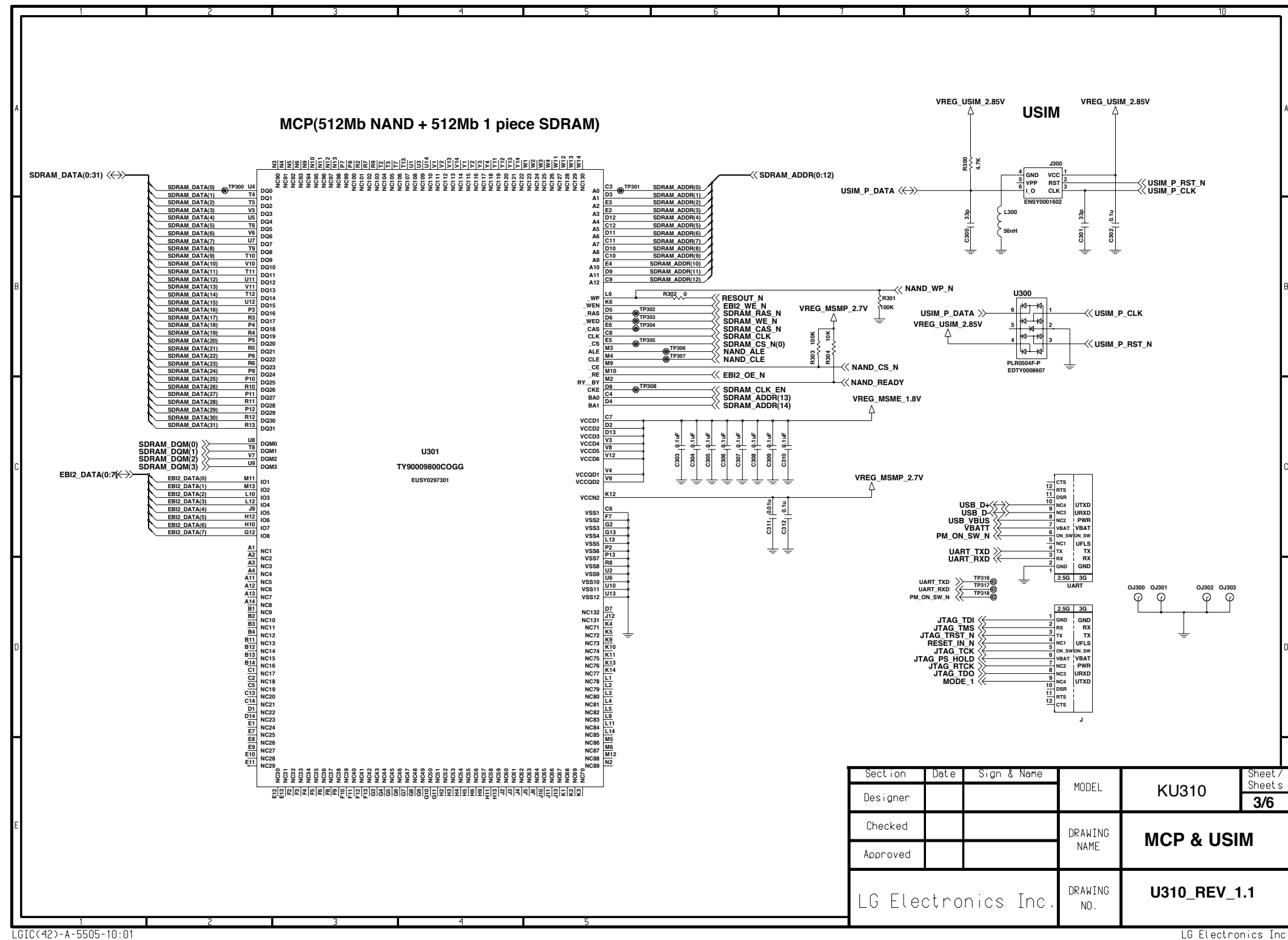
## 7. CIRCUIT DIAGRAM



# 7. CIRCUIT DIAGRAM

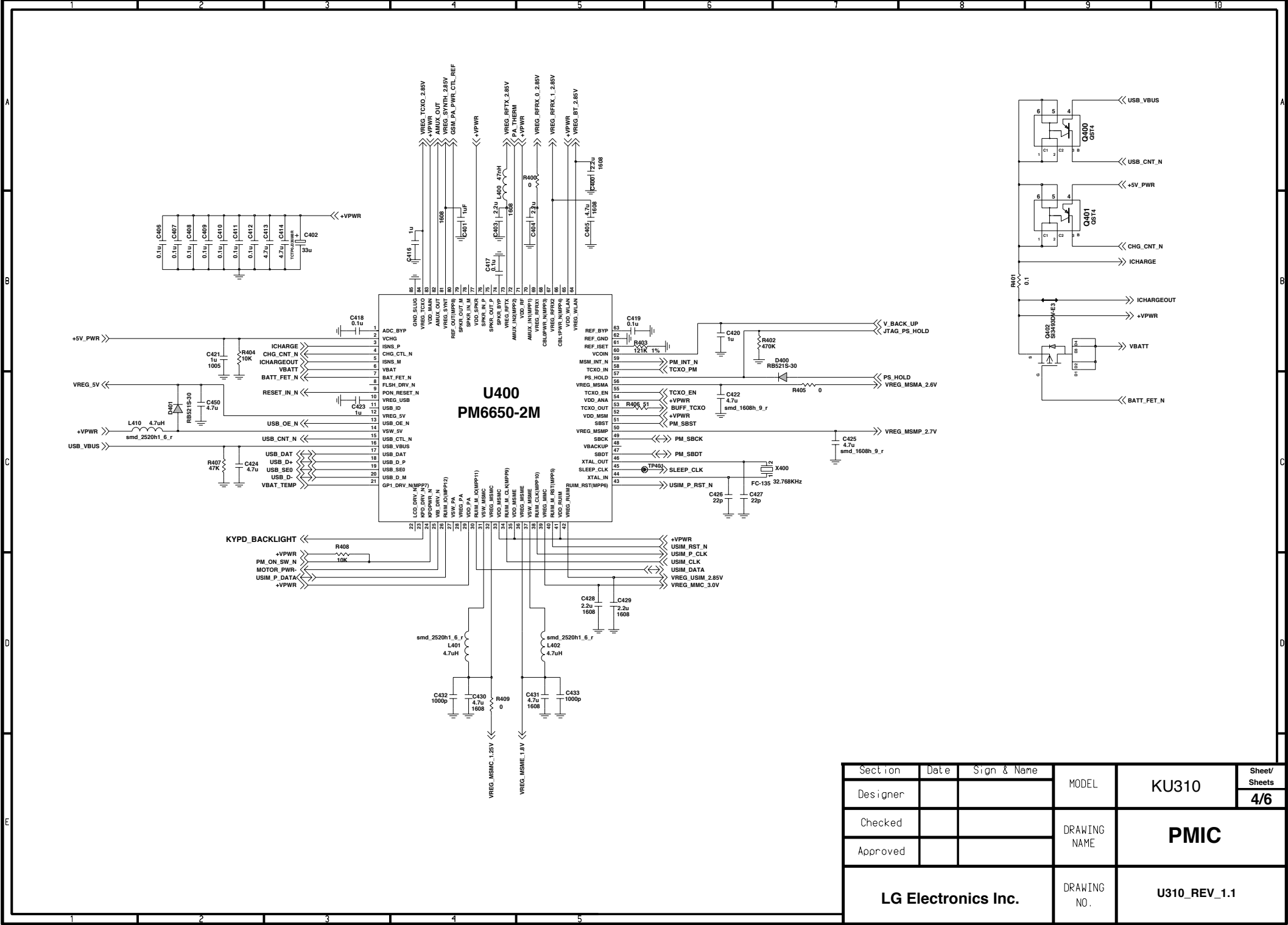


## 7. CIRCUIT DIAGRAM





# 7. CIRCUIT DIAGRAM

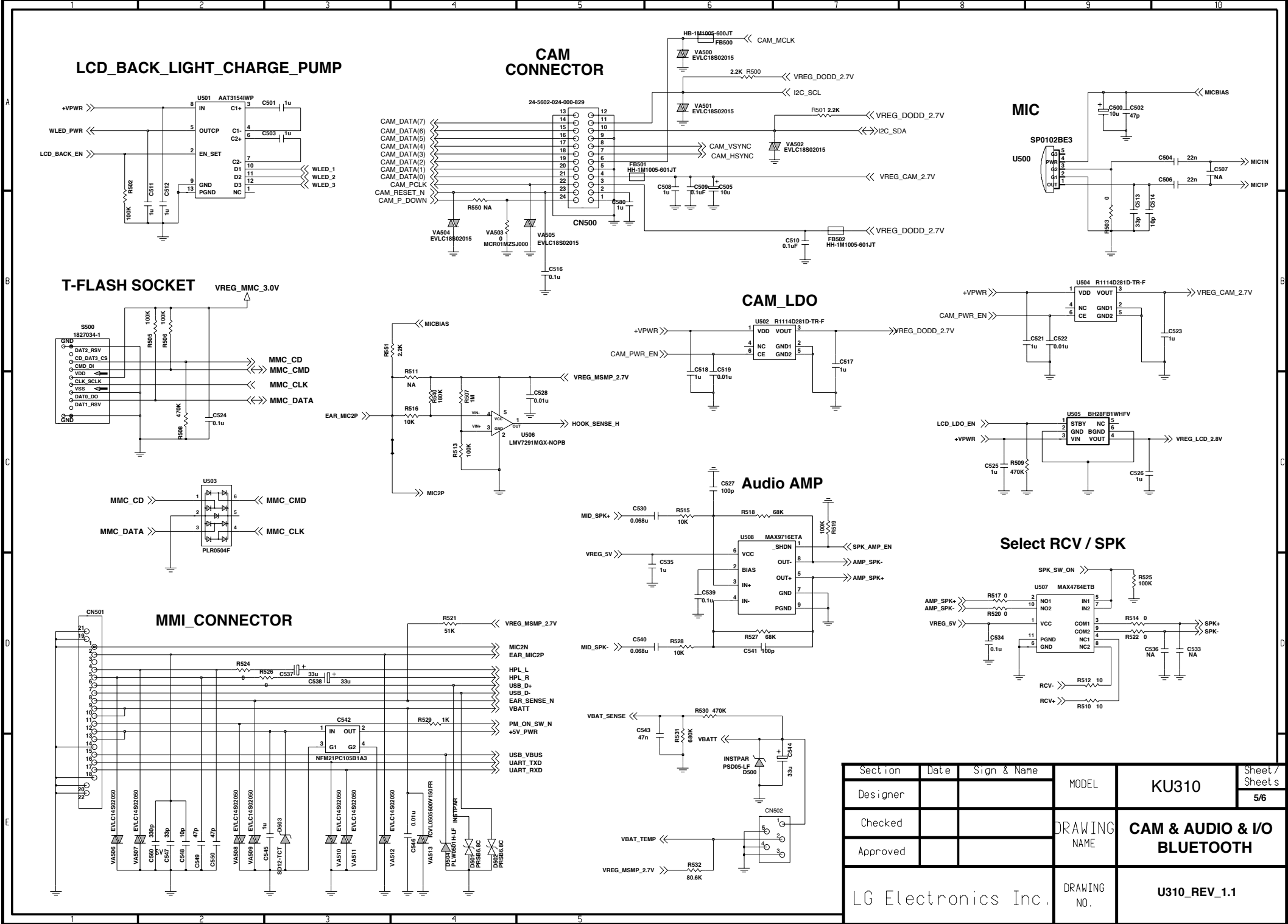


LGIC(42)-A-5505-10:01

LG Electronics Inc.

Section	Date	Sign & Name	MODEL	KU310	Sheet/ Sheets
Designer					4/6
Checked			DRAWING NAME	PMIC	
Approved					
LG Electronics Inc.			DRAWING NO.	U310_REV_1.1	

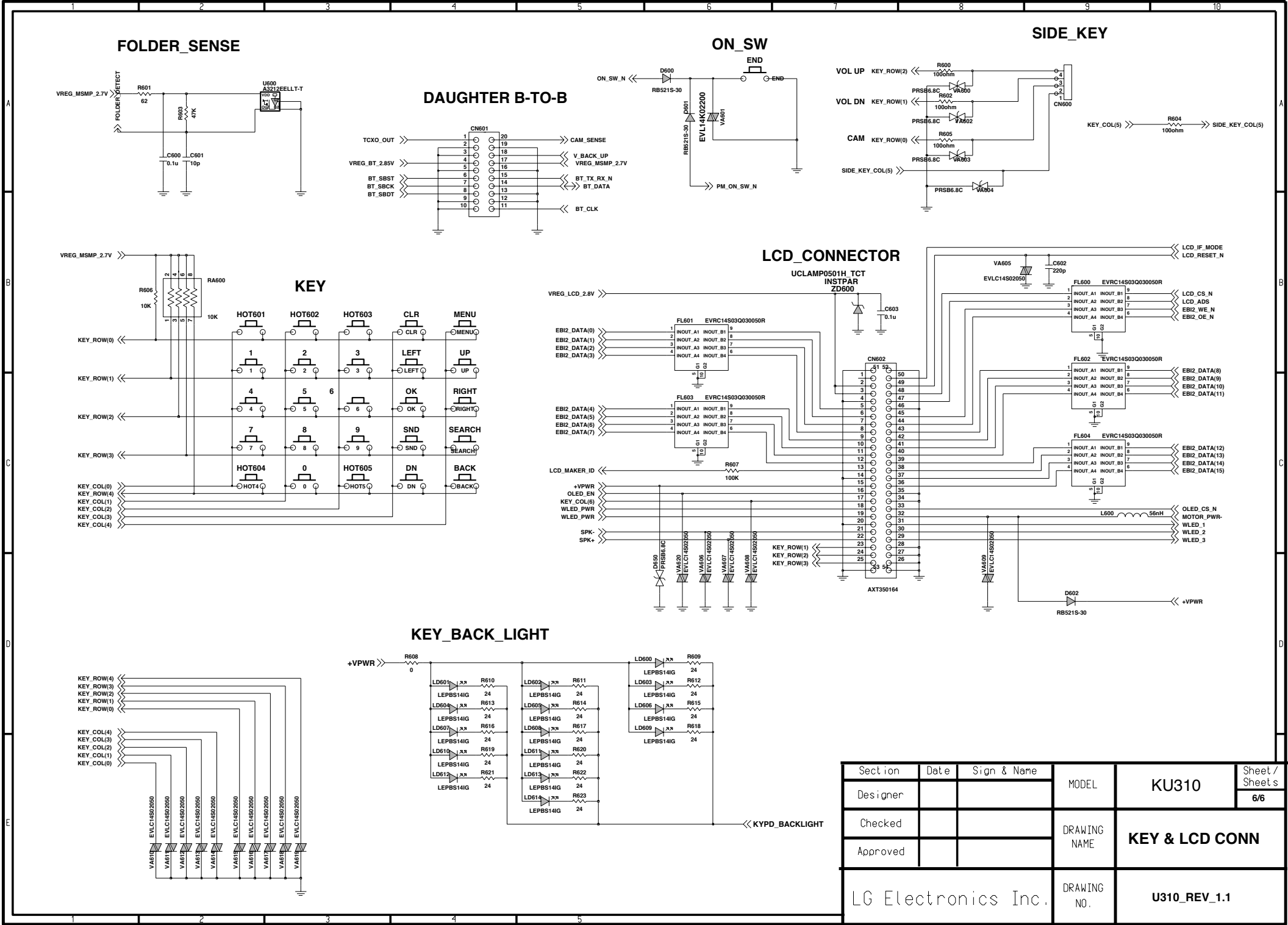
# 7. CIRCUIT DIAGRAM



LGIC(42)-A-5505-10:01

LG Electronics Inc.

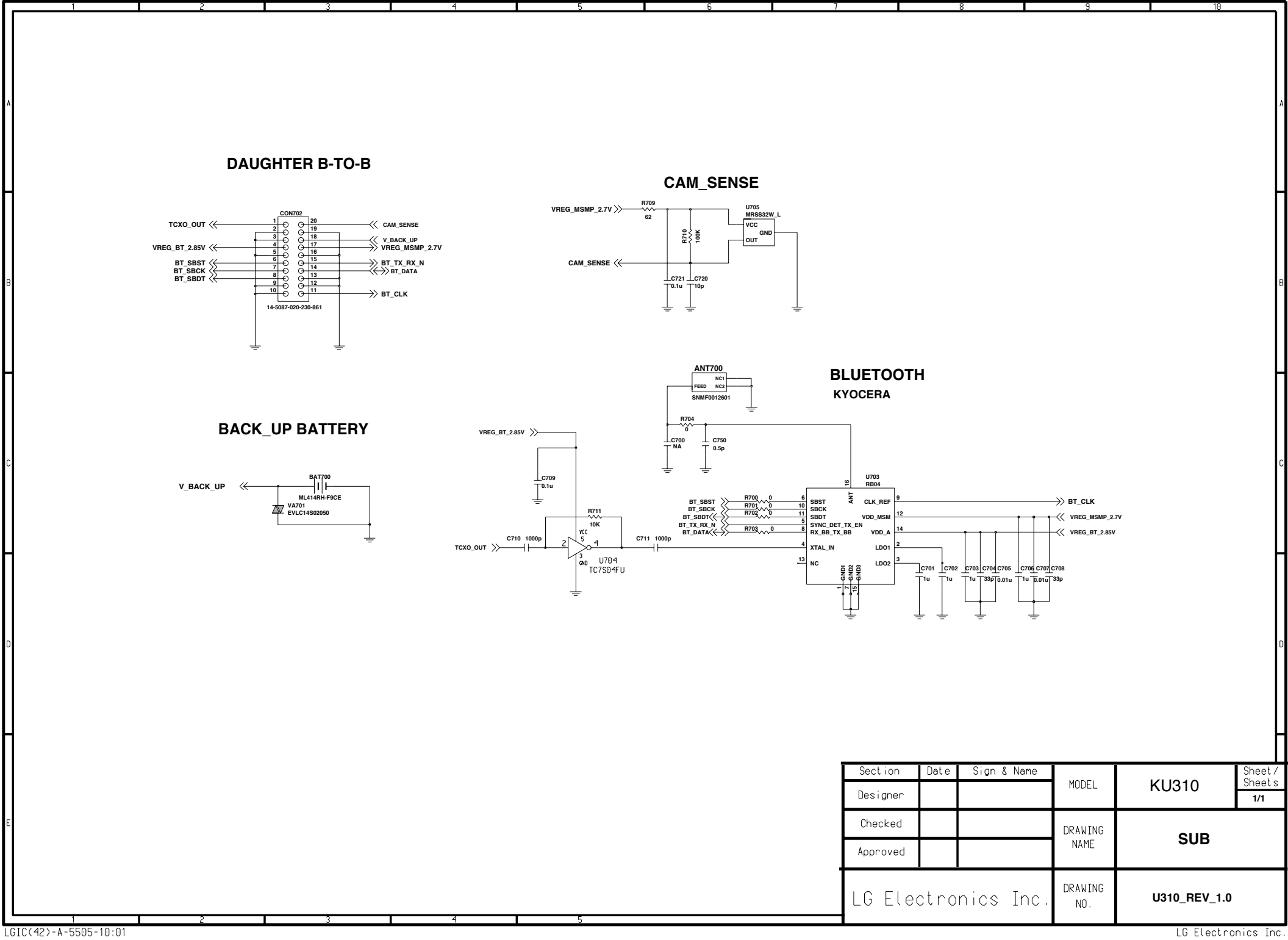
# 7. Circuit Diagram



LGIC(42)-A-5505-10:01

LG Electronics Inc.

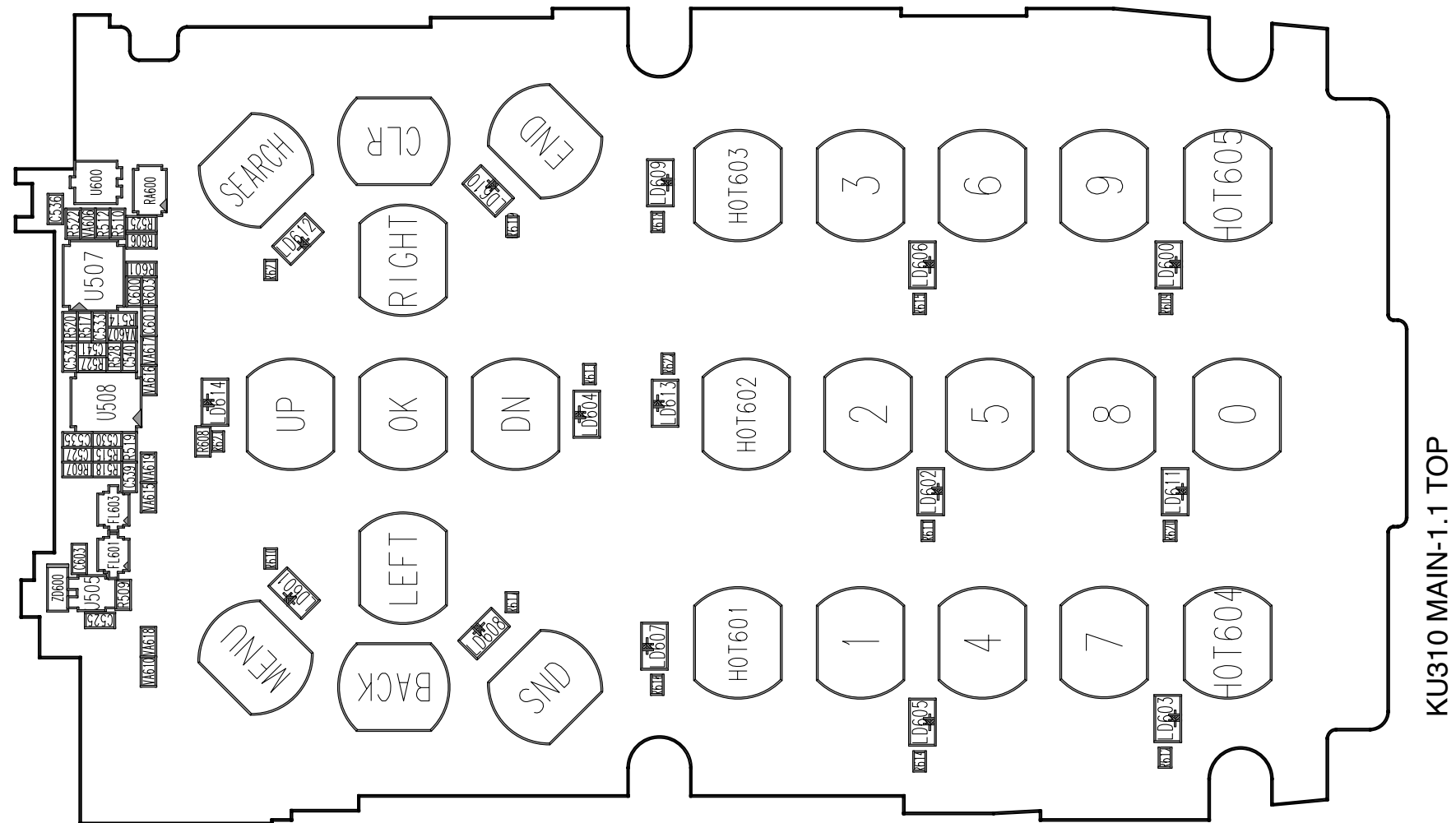
7. Circuit Diagram



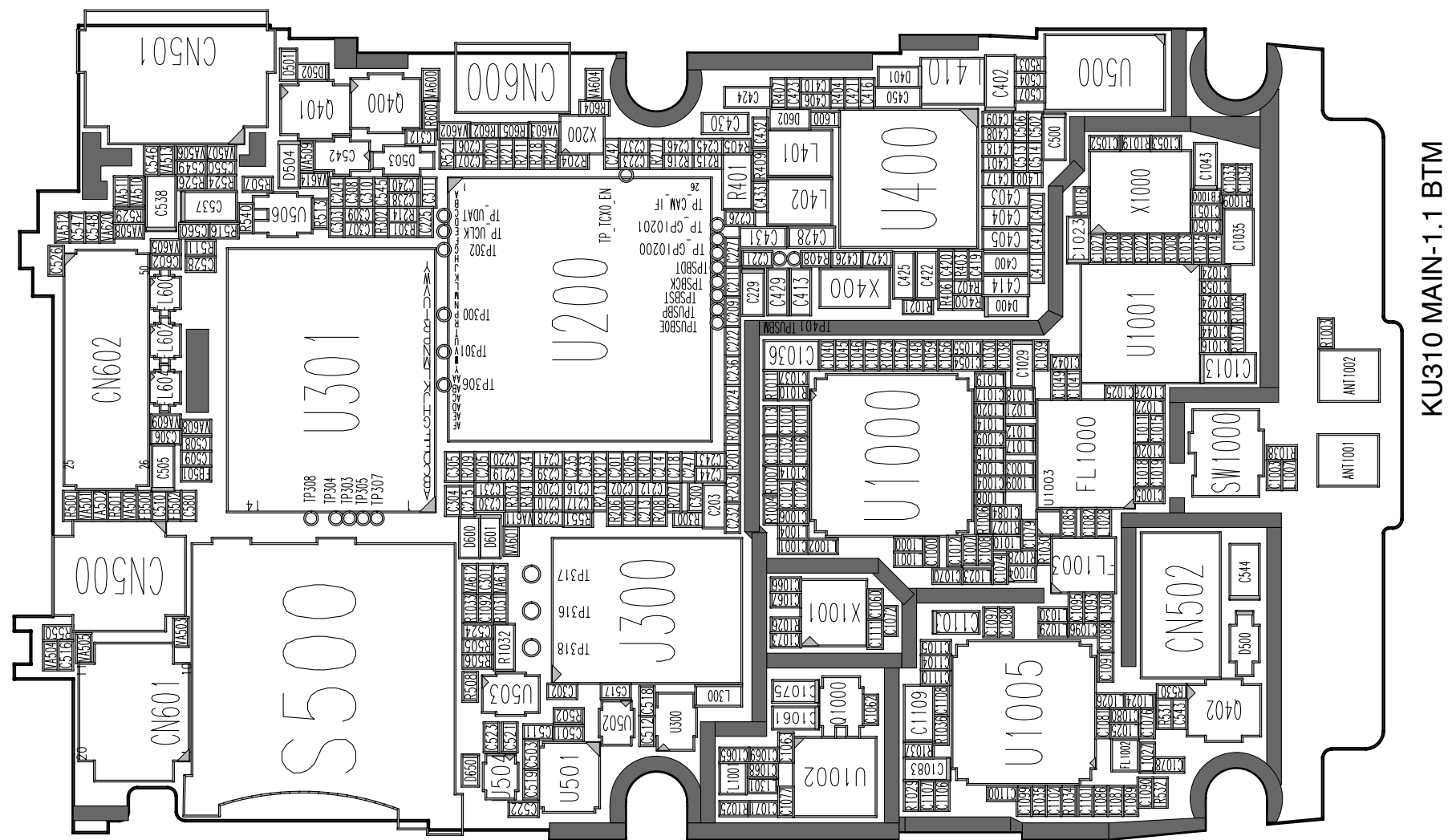
LGIC(42)-A-5505-10:01

LG Electronics Inc.

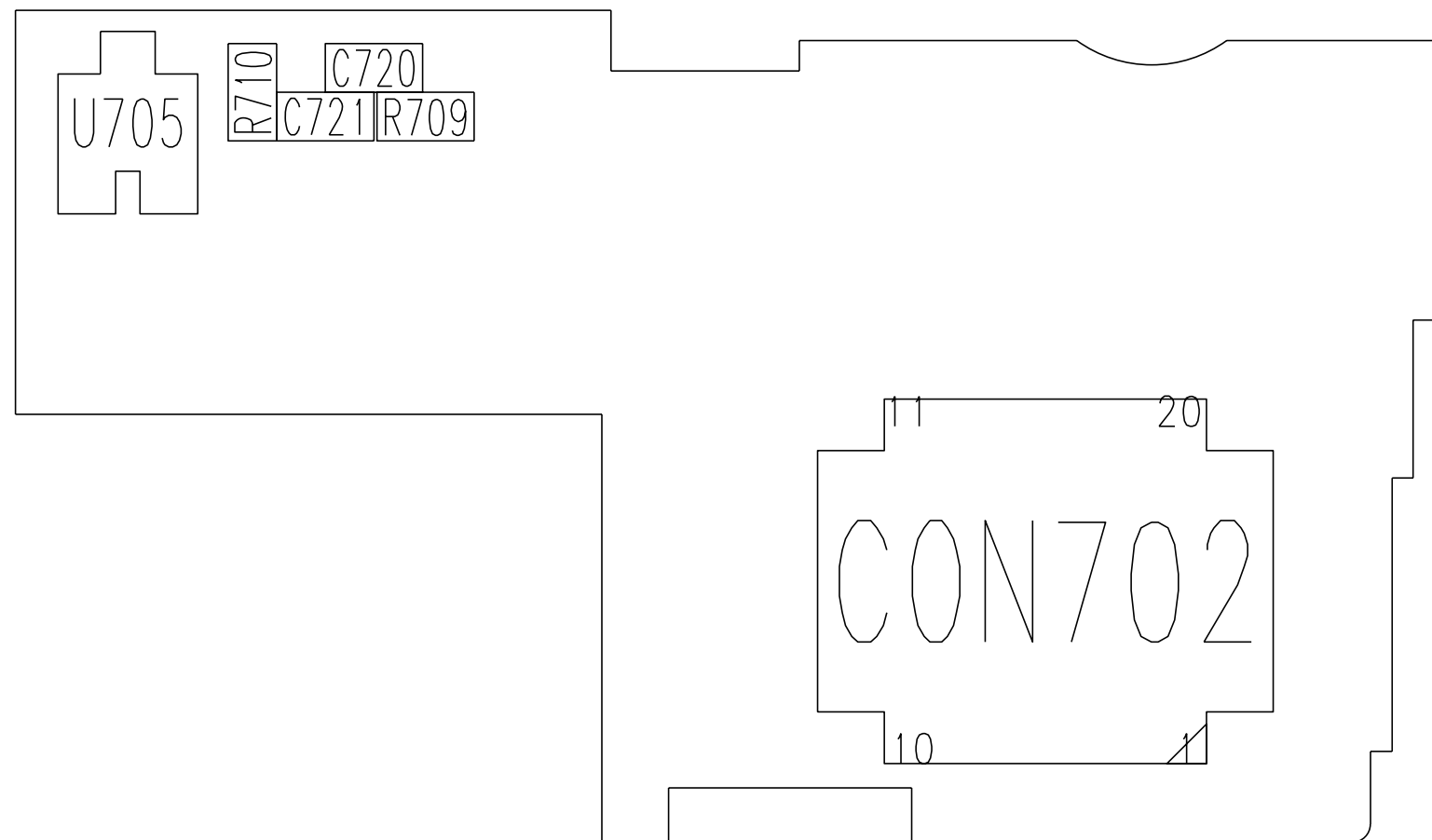
## 8. pcb layout



## 8. pcb layout

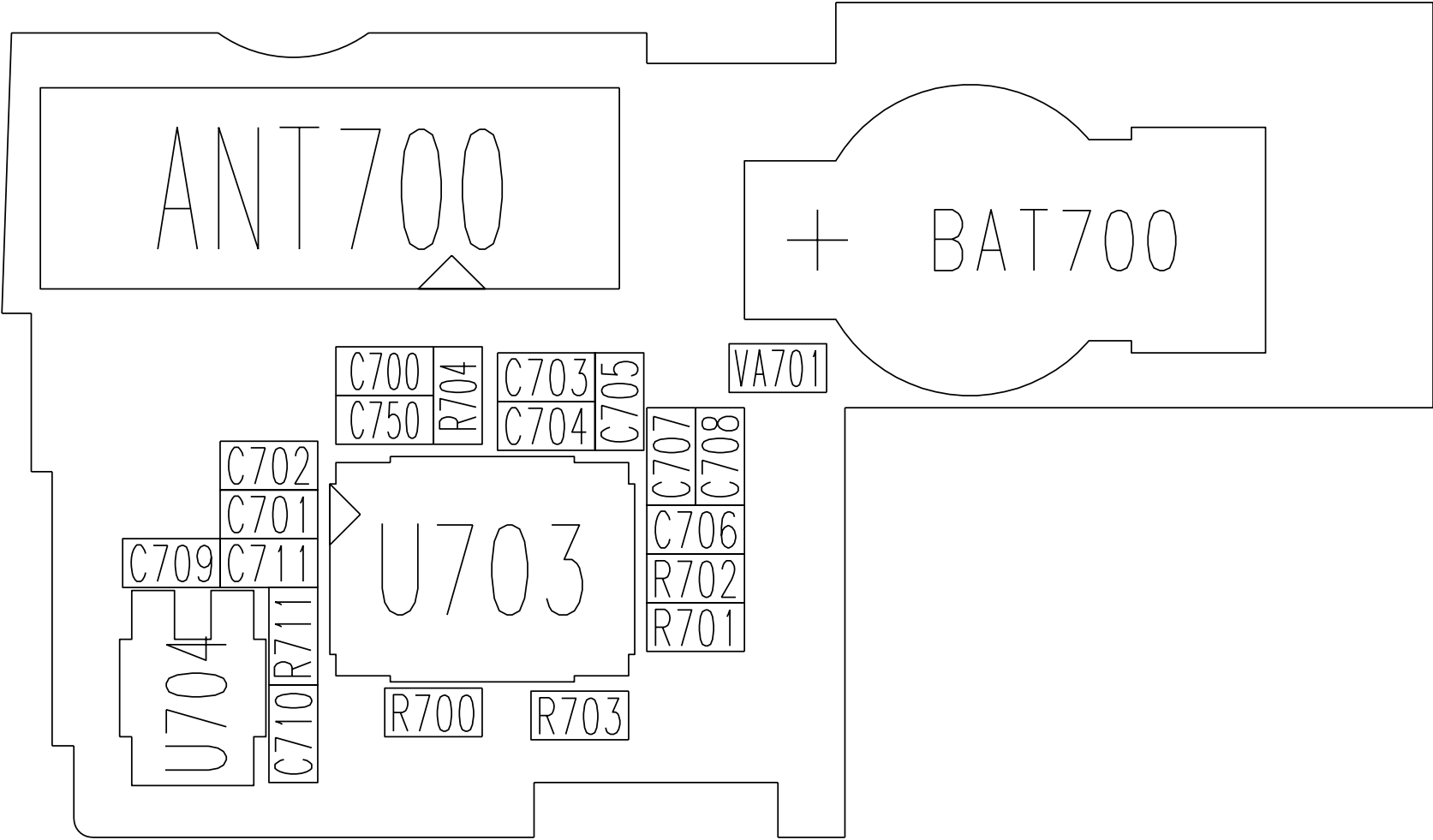


## 8. pcb layout



KU310 SUB-1.0 TOP

8. pcb layout



KU310 SUB-1.0 BTM

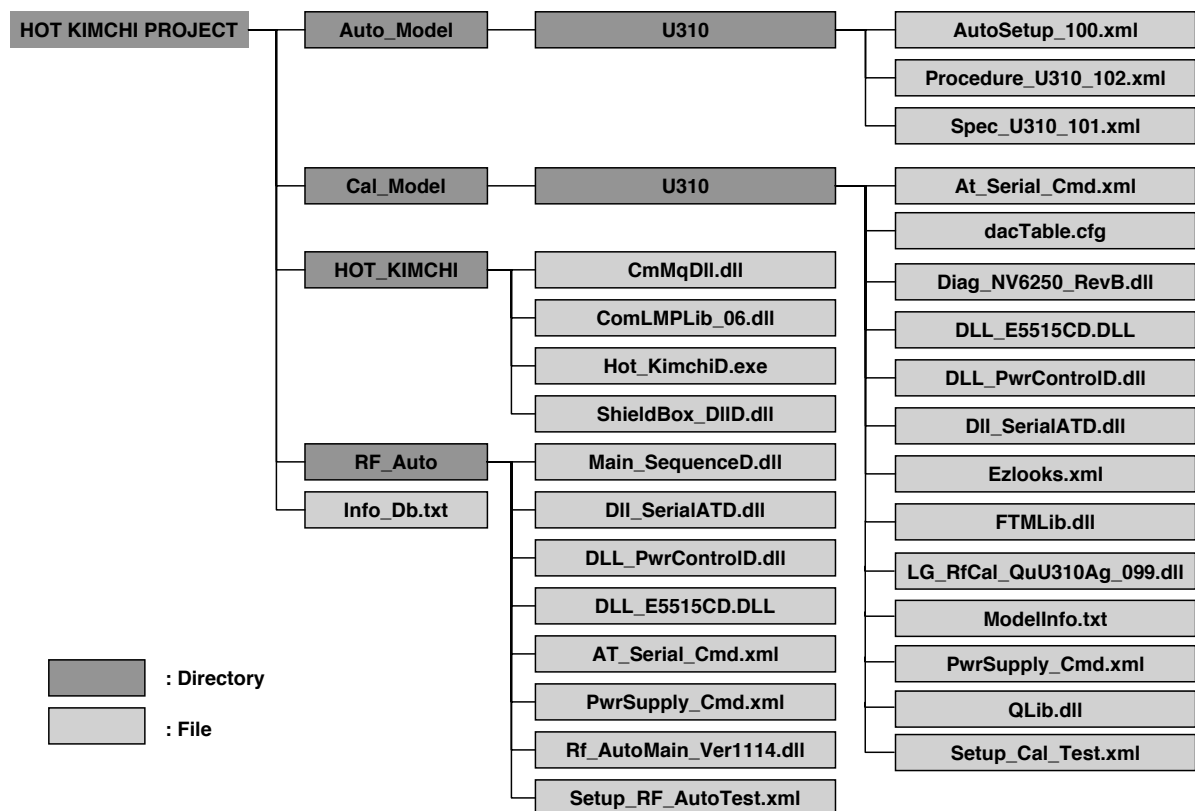




# 9. Calibration & RF Auto Test Program

## 9.1 Configuration of HOT KIMCHI

### 9.1.1 Configuration of directory



## 9. Calibration & RF Auto Test Program

---

### 9.1.2 Setup file (Info\_Db.txt)

```
/*cal*/[Default]=[KU310]
①/*cal*/②[KU310]=③[..\Cal Model\KU310\LG_RfCal_QuKU310Ag_099.dll]

/*auto*/[KU310]=[\RF Auto\Rf_AutoMain_Ver1114.dll]
④
[ezlooks]=[off]
[batcal]=[off]
[svc]=[off]
[standalone]=[off]
[tescom]=[off]
⑤
[process]=[cal]
⑥[KU310]=⑦[\Auto Model\KU310\Procedure_KU310_102.xml...\Auto Model\KU310\Spec_KU310_101.
xml...\Auto Model\KU310\AutoSetup_100.xml]
```

**'on' or 'off'. (use only lower case)**

**'auto' or 'cal'. (use only lower case)**

1: Indication of 'cal process' or 'auto process'

2: Model name which is displayed on Hot Kimchi program

3: Relative path of Main Sequence dll file from Hot\_KimchiD.exe

4: You can change this as 'on' or 'off'(should be in lower case; on, off)

5: You can change this as 'auto' or 'cal'(should be in lower case; on, off)

6: Auto model name

7: Relative path of auto model procedure, spec, setting file from Hot\_KimchiD.exe

### 9.1.3 Items of setup file

[ezlooks] => The yes or no for using ezlooks

Domestic: on, Overseas: off

[batcal] => The yes or no for using battery calibration

[svc] => The yes or no for using HOT KIMCHI at service center

Domestic: off, Service Center: on

[standalone] => Overseas factory or Service Center: on, Domestic: off

[tescom] => The yes or no for using TESCOM shield box

[process] => selection of the process (auto or cal)

[L600i] => procedure, spec., setup file name (only for auto)

## 9. Calibration & RF Auto Test Program

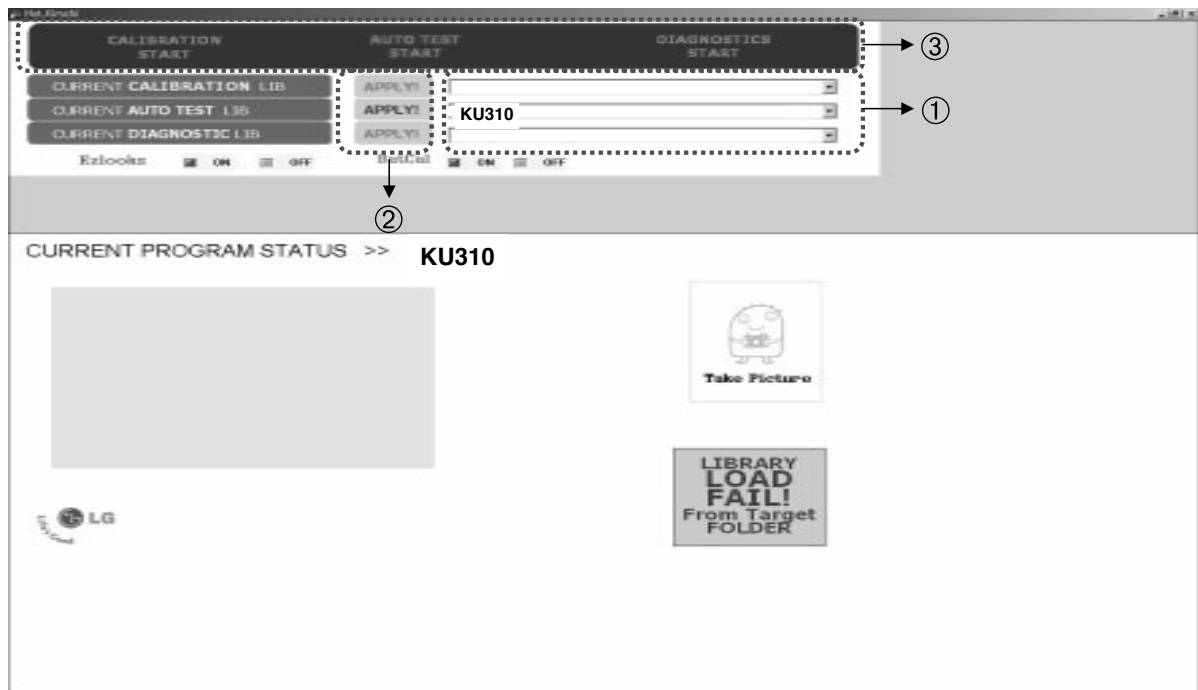
---

### 9.1.4 Example for setup file

CAL Process	
Ex1) Service center	[ezlooks]=[off] [batcal]=[off] [svc]=[on] [standalone]=[off] [tescom]=[off] [process]=[cal]
Ex2) Overseas factory or Repair	[ezlooks]=[off] [batcal]=[on] [svc]=[off] [standalone]=[on] [tescom]=[off] [process]=[cal]
Ex3) Domestic factory	[ezlooks]=[on] [batcal]=[on] [svc]=[off] [standalone]=[off] [tescom]=[off] [process]=[cal]

In case of using Tescom S/B, set [tescom]=[on].

### 9.2. How to use HOT KIMCHI

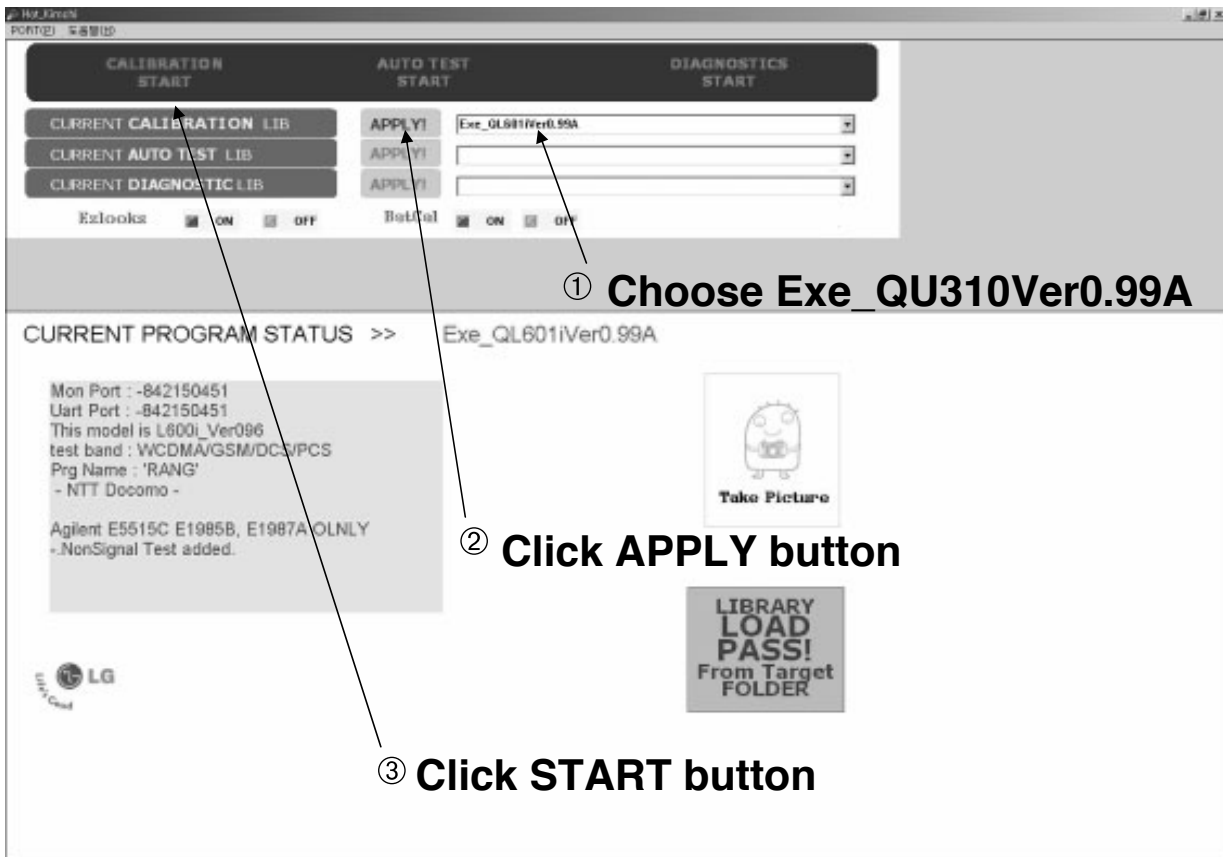


#### \* Flow

1. Select the model name which you want
2. Click **APPLY** button to load the 'cal'.
3. Click **START** button to run the procedure which you want

## 9. Calibration & RF Auto Test Program

### 9.3 Example for using HOT KIMCHI



KU310\_Ver0.99A Calibration

## 9. Calibration & RF Auto Test Program

### 9.3.1 Example for Calibration



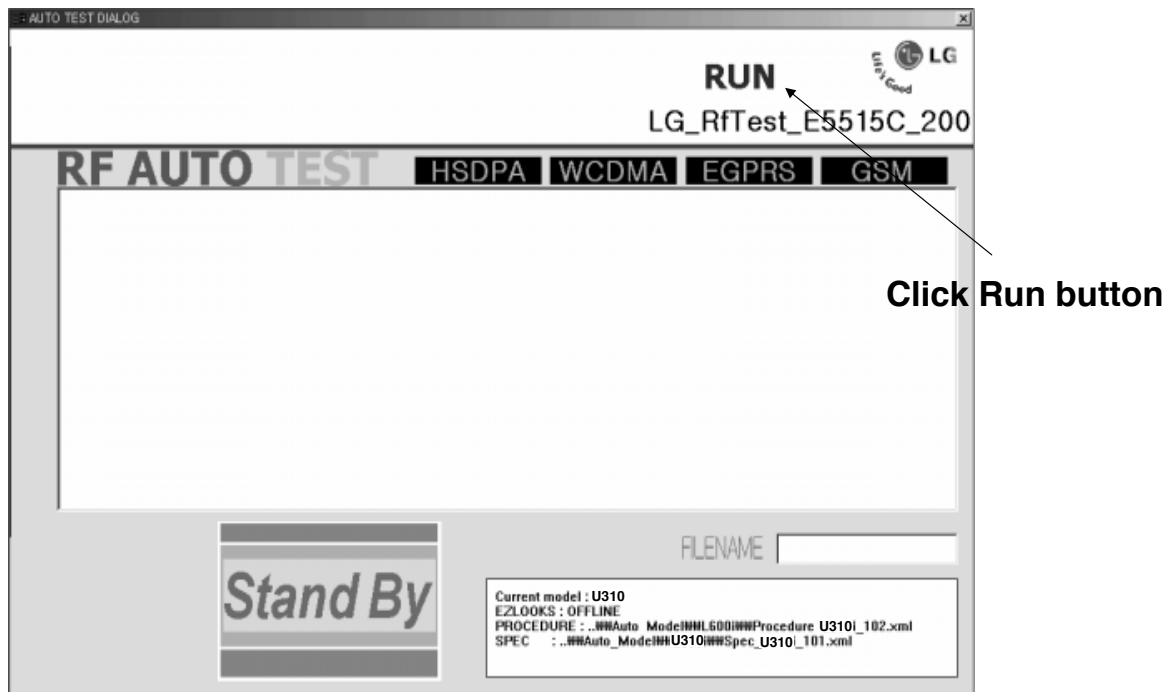
Click START



## 9. Calibration & RF Auto Test Program

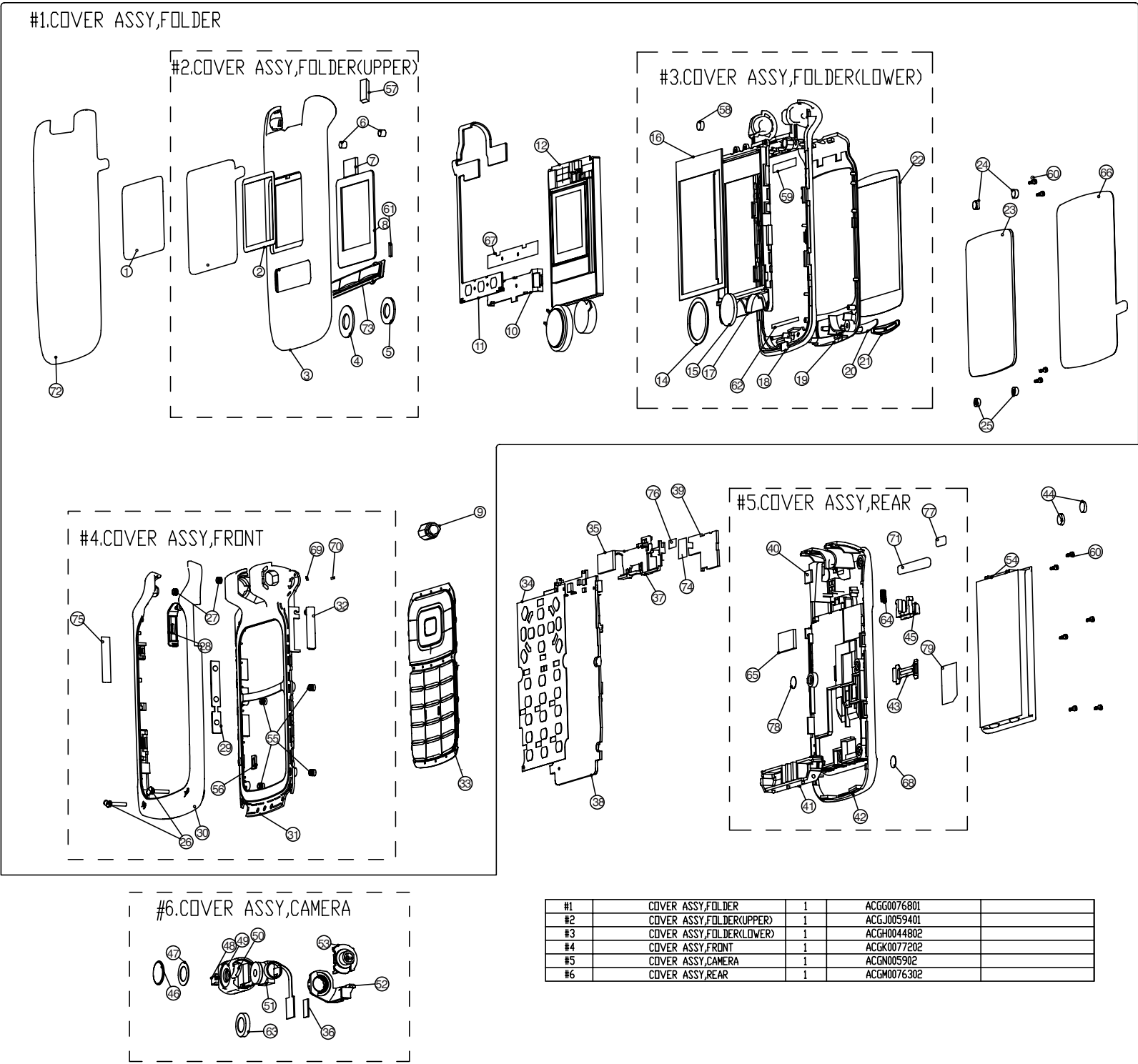
---

### 9.3.2 Example for RF Auto Test



10. EXPLODED VIEW & REPLACEMENT PART LIST

10.1 EXPLODED VIEW



79	LABEL,MODEL	1	MLAK0006901	
78	LABEL,A/S	1	MLAB0001102	
77	LABEL,QUAL.COMM	1	MLAN0000603	
76	TAPE,SHIELD (CONDUCTIVE)	1	MTAC0039101	
75	TAPE,PROTECTION(SIDE)	1	MTAB0128801	
74	TAPE(FRAME)	1	MTAZ0174601	
73	BUTTON ASSY,FUNTION	1	ABGB0004501	
72	TAPE,PROTECTION(FOLDER)	1	MTAB0127601	
71	LABEL,WARNING	1	MLAR0005101	
70	TAPE,SHIELD (EARJACK)	1	MTAC0042401	
69	TAPE,SHIELD (FRONT)	1	MTAC0041301	
68	CAP,MS SHEET	1	MCCF0041002	
67	TAPE(MOD PLATE)	1	MTAZ0133001	
66	TAPE,PROTECTION(MAIN)	1	MTAB0127701	
65	GASKET,SHIELD FORM(REAR, 2)	1	MGAD0131501	
64	SPRING, LOCKER	1	MSDC0008301	
63	PAD,CAMERA	1	MPBT0030101	
62	TAPE(LOWER DECO,UP)	1	MTAZ0161301	
61	GASKET,SHIELD FOAM(LCD)	1	MGAD0126801	
60	SCREW, MACHINE, BIND	10	GMEY0011201	
59	TAPE(LOWER DECO,DOWN)	1	MTAZ0144301	
58	MAGNET(SWITCH)	1	MMAA0001601	
57	PAD,FLEXIBLE PCB (UPPER)	1	MPBF0017501	
56	PAD,MIKE	1	MPBH0024101	
55	INSERT,FRONT	4	MICC0008201	
54	BATTERY, ASSY	1		
53	CAP, CAMERA	1	MCCK0005502	
52	BUSHING	1	MBIZ0002802	
51	CAMERA MODULE	1	SVCY0011901	
50	MAGNET	1	MMAZ0004201	
49	COVER, CAMERA (FRONT)	1	MCJP0005802	
48	TERMINAL ASSY(POGO PIN)	1	ATBZ0000901	
47	TAPE, WINDOW (CAMERA)	1	MTAD0055101	
46	WINDOW, CAMERA	1	MWAE0019301	
45	LOCKER, BATTERY	1	MLEA0032602	
44	CAP, SCREW (REAR)_L/R	1	(MCCH0088502, MCCH0089202)	
43	LOCKER, SIM	1	MLEY0000801	
42	COVER, REAR	1	MCJN0055702	
41	ANTENNA	1	SNGF0019401	
40	GASKET,SHIELD FORM(REAR)	1	MGAD0130001	
39	PCB ASSY,SUB	1	SAJY0019101	
38	PCB ASSY, MAIN	1	SAFY0163001	
37	FRAME, SHIELD	1	MFEA0011601	
36	PAD,CAMERA CONN	1	MPBZ0143901	
35	GASKET,SHIELD FOAM(MAIN)	1	MGAD0126901	
34	DOME ASSY, METAL (MAIN)	1	ADCA0061001	
33	KEYPAD	1	MKAZ0031802	
32	CAP, MULTIMEDIA CARD	1	MCCG0006102	
31	COVER, FRONT	1	MCJK0061202	
30	DECO, FRONT	1	MDAG0021902	
29	BUTTON, SIDE	1	MBJL0034901	
28	CAP,EARPHONE JACK	1	MCCC0038102	
27	INSERT,FRONT	2	MICA0019901	
26	STOPPER, FRONT	2	MSGY0017302	
25	CAP, SCREW (UP)	1	MCCH0088702	
24	CAP, SCREW (DOWN)	1	MCCH0089102	
23	WINDOW, LCD (MAIN)	1	MWAC0069101	
22	TAPE, WINDOW (MAIN)	1	MTAD0055001	
21	DECO, RECEIVER	1	MDAH0018501	
20	SPEAKER, FILTER	1	MFBC0024401	
19	DECO, FOLDER (LOWER)	1	MDAF0009002	
18	COVER, FOLDER (LOWER)	1	MCJH0035802	
17	BRACKET,LCD	1	MBFF0010401	
16	PAD, LCD	1	MPBG0048101	
15	PAD,MOTOR (LOWER)	1	MPBJ0034601	
14	PAD,SPEAKER (LOWER)	1	MPBN0032001	
12	LCD, ASSY	1	SVLM0021202	
11	MAIN, FPCB	1	SACY0049101	
10	PLATE, MODKEY	1	MPFZ0025601	
9	HINGE, FOLDER	1	MHFD0013401	
8	PAD, LCD(SUB)	1	MPBQ0028801	
7	PAD,FLEXIBLE PCB (CONN)	1	MPBF0017101	
6	INSERT, UPPER	4	MICZ0014901	
5	PAD, MOTOR (UPPER)	1	MPBJ0034501	
4	PAD, SPEAKER (UPPER)	1	MPBN0031901	
3	COVER, FOLDER (UPPER)	1	MCJJ0045401	
2	TAPE, WINDOW(SUB)	1	MTAE0028201	
1	WINDOW,LCD(SUB)	1	MWAF0034001	
NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK



## 10. EXPLODED VIEW & REPLACEMENT PART LIST

### 10.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		IMT,FOLDER	TIFF0013301			
2	AAAY00	ADDITION	AAAY0183901		Without Color	
2	APEY00	PHONE	APEY0296784		White	
3	ACGG00	COVER ASSY,FOLDER	ACGG0074406		Color Unfixed	
4	ACGH00	COVER ASSY, FOLDER(LOWER)	ACGH0044801		Color Unfixed	
5	MBFF00	BRACKET,LCD	MBFF0010401	CASTING, Al Alloy, , , , ,	Black	17
5	MCJH00	COVER,FOLDER(LOWER)	MCJH0035801	MOLD, PC LUPOY SC-1004A, , , , ,	White	18
5	MDAF00	DECO,FOLDER(LOWER)	MDAF0009001	MOLD, PC LUPOY SC-1004A, , , , ,	White	19
5	MDAH00	DECO,RECEIVER	MDAH0018501	PRESS, STS, , , , ,	Silver	21
5	MFBC00	FILTER,SPEAKER	MFBC0024401	COMPLEX, (empty), , , , ,	Without Color	20
5	MMAA00	MAGNET,SWITCH	MMAA0001601	7100 magnetic	Silver	58
5	MPBG00	PAD,LCD	MPBG0048101	COMPLEX, (empty), , , , ,	Without Color	16
5	MPBJ00	PAD,MOTOR	MPBJ0034601	COMPLEX, (empty), , , , ,	Without Color	15
5	MPBN00	PAD,SPEAKER	MPBN0032001	COMPLEX, (empty), , , , ,	Without Color	14
5	MTAD00	TAPE,WINDOW	MTAD0055001	COMPLEX, (empty), , , , ,	Without Color	22
5	MTAZ02	TAPE	MTAZ0144301	COMPLEX, (empty), , , , ,	Without Color	59
5	MTAZ03	TAPE	MTAZ0161301	COMPLEX, (empty), , , , ,	Without Color	62
4	ACGJ00	COVER ASSY, FOLDER(UPPER)	ACGJ0058504		Color Unfixed	
5	ABGB00	BUTTON ASSY,FUNCTION	ABGB0004601	MOLD	White	73
5	MCJJ00	COVER,FOLDER(UPPER)	MCJJ0044501	MOLD, PC LUPOY SC-1004A, , , , ,	White	3
6	MICA00	INSERT,FRONT	MICA0010701		Silver	6
5	MPBF00	PAD,FLEXIBLE PCB	MPBF0017101	COMPLEX, (empty), , , , ,	Without Color	7
5	MPBF01	PAD,FLEXIBLE PCB	MPBF0017501	COMPLEX, (empty), , , , ,	Black	57
5	MPBJ00	PAD,MOTOR	MPBJ0034501	COMPLEX, (empty), , , , ,	Black	5
5	MPBN00	PAD,SPEAKER	MPBN0031901	COMPLEX, (empty), , , , ,	Without Color	4

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	MPBQ00	PAD,LCD(SUB)	MPBQ0028801	COMPLEX, (empty), , , , ,	Without Color	8
5	MTAB00	TAPE,PROTECTION	MTAB0127501	COMPLEX, (empty), , , , ,	Without Color	13
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0028201	COMPLEX, (empty), , , , ,	Without Color	2
4	ACGK00	COVER ASSY,FRONT	ACGK0077201		Color Unfixed	
5	MBJL00	BUTTON,SIDE	MBJL0034901	COMPLEX, (empty), , , , ,	Silver	29
5	MCCC00	CAP,EARPHONE JACK	MCCC0038101	COMPLEX, (empty), , , , ,	Silver	28
5	MCCG00	CAP,MULTIMEDIA CARD	MCCG0006101	COMPLEX, (empty), , , , ,	Silver	32
5	MCJK00	COVER,FRONT	MCJK0061201	MOLD, PC LUPOY SC-1004A, , , , ,	White	31
6	MICC00	INSERT,FRONT(UPPER)	MICC0008201		Color Unfixed	55
5	MDAG00	DECO,FRONT	MDAG0021901	MOLD, PC LUPOY SC-1004A, , , , ,	Silver	30
6	MICA00	INSERT,FRONT	MICA0019901	M1.4 D2.2 L1.5	Gold	27
5	MIDZ00	INSULATOR	MIDZ0116001	COMPLEX, (empty), 0.05, , , ,	Black	71
5	MPBH00	PAD,MIKE	MPBH0024101	COMPLEX, (empty), , , , ,	Without Color	56
5	MSGY00	STOPPER	MSGY0017301	MOLD, Urethane Rubber S190A, , , , ,	Silver	26
5	MTAB00	TAPE,PROTECTION	MTAB0128801	COMPLEX, (empty), , , , ,	Without Color	75
5	MTAC00	TAPE,SHIELD	MTAC0042401	COMPLEX, (empty), , , , ,	Without Color	70
5	MTAC01	TAPE,SHIELD	MTAC0041301	COMPLEX, (empty), , , , ,	Without Color	69
4	APGZ00	PLATE ASSY	APGZ0002301	MOD	Without Color	
5	MPFZ00	PLATE	MPFZ0025601	PRESS, STS, , , , ,	Silver	10
5	MTAZ00	TAPE	MTAZ0133001	COMPLEX, (empty), , , , ,	Without Color	67
4	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	60
4	MCCH00	CAP,SCREW	MCCH0088701	MOLD, Silicone Rubber K-770, , , , ,	White	25
4	MCCH02	CAP,SCREW	MCCH0089101	MOLD, Silicone Rubber K-770, , , , ,	Silver	24
4	MGAD00	GASKET,SHIELD FORM	MGAD0126801	COMPLEX, (empty), , , , ,	Without Color	61
4	MGAD01	GASKET,SHIELD FORM	MGAD0126901	COMPLEX, (empty), , , , ,	Without Color	35
4	MHFD00	HINGE,FOLDER	MHFD0013401		Silver	9
4	MTAB00	TAPE,PROTECTION	MTAB0127601	COMPLEX, (empty), , , , ,	Without Color	72

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	MTAB01	TAPE,PROTECTION	MTAB0127701	COMPLEX, (empty), , , , ,	Without Color	66
4	MWAC00	WINDOW,LCD	MWAC0069101	CUTTING, PMMA MR 200, , , , ,	Without Color	23
4	MWAF00	WINDOW,LCD(SUB)	MWAF0035001	CUTTING, PMMA MR 200, , , , ,	Without Color	1
3	ACGM00	COVER ASSY,REAR	ACGM0076301		Color Unfixed	
4	MCJN00	COVER,REAR	MCJN0055701	MOLD, PC LUPOY SC-1004ML, , , , ,	White	42
4	MGAD00	GASKET,SHIELD FORM	MGAD0130001	COMPLEX, (empty), , , , ,	Without Color	40
4	MGAD01	GASKET,SHIELD FORM	MGAD0131501	COMPLEX, (empty), , , , ,	Without Color	65
4	MLAB00	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	White	78
4	MLAN00	LABEL,QUALCOMM	MLAN0000601	Black,95C	Transparent	77
4	MLAZ01	LABEL	MLAZ0045501	PRINTING, (empty), , , , ,	White	
4	MLEA00	LOCKER,BATTERY	MLEA0032601	CASTING, STS, , , , ,	White	45
4	MLEY01	LOCKER	MLEY0000801	SIM LOCKER	Silver	43
4	MSDC00	SPRING,LOCKER	MSDC0008301		Without Color	64
3	ACGN00	COVER ASSY,CAMERA	ACGN0005901		White	
4	ACGP00	COVER ASSY, CAMERA(FRONT)	ACGP0004301		White	
5	ATBZ00	TERMINAL ASSY	ATBZ0000901		Black	48
5	MCJP00	COVER,CAMERA(FRONT)	MCJP0005801	MOLD, PC LUPOY SC-1004ML, , , , ,	White	49
5	MMAZ00	MAGNET	MMAZ0004201	COMPLEX, (empty), , , , ,	Silver	50
5	MTAD00	TAPE,WINDOW	MTAD0055101	COMPLEX, (empty), , , , ,	Without Color	47
4	MBIZ00	BUSHING	MBIZ0002801	MOLD, PC LUPOY SC-1004A, , , , ,	White	52
4	MCCK00	CAP,CAMERA	MCCK0005501	MOLD, PC LUPOY SC-1004A, , , , ,	White	53
4	MPBT00	PAD,CAMERA	MPBT0030101	COMPLEX, (empty), , , , ,	Without Color	63
4	MPBZ00	PAD	MPBZ0143901	COMPLEX, (empty), , , , ,	Without Color	36
4	MWAE00	WINDOW,CAMERA	MWAE0019301	CUTTING, PMMA MR 200, , , , ,	Black	46
3	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	
3	MCCF00	CAP,MOBILE SWITCH	MCCF0041001	COMPLEX, (empty), 0.15, , , ,	White	68
3	MCCH00	CAP,SCREW	MCCH0088501	MOLD, Silicone Rubber K-770, , , , ,	White	44
3	MCCH01	CAP,SCREW	MCCH0089201	MOLD, PC LUPOY SC-1004ML, , , , ,	White	44
3	MKAZ00	KEYPAD	MKAZ0031811	COMPLEX, (empty), , , , ,	White	33

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Specification	Color	Remark
3	MLAK00	LABEL,MODEL	MLAK0006901			79
5	ADCA00	DOMES ASSY,METAL	ADCA0054401		Without Color	34
5	MLAZ00	LABEL	MLAZ0038301	PID Label 4 Array	Without Color	
5	AFBA00	FRAME ASSY,SHIELD	AFBA0004701		Without Color	
6	MFEA00	FRAME,SHIELD	MFEA0011601	CASTING, Zn Alloy, , , , ,	Silver	37
6	MTAC00	TAPE,SHIELD	MTAC0039101	COMPLEX, (empty), , , , ,	Without Color	76
6	MTAZ00	TAPE	MTAZ0174601	COMPLEX, (empty), , , , ,	Without Color	74

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

### 10.2 Replacement Parts <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SACY00	PCB ASSY,FLEXIBLE	SACY0049101	Main FPCB		11
5	SACB00	PCB ASSY, FLEXIBLE,INSERT	SACB0032401	Main FPCB		
6	SJMY00	VIBRATOR,MOTOR	SJMY0002605	3 V,0.08 A,12*3.4 ,12mm		
6	SUSY00	SPEAKER	SUSY0023501	ASSY ,8 ohm,90 dB,17 mm, , , , , , ,WIRE		
6	SVLM00	LCD MODULE	SVLM0021202	MAIN ,M_176*220 S_96*96 ,38.1*51.88*4.0 ,262k ,TFT ,TM ,M_S1D19105 S_LGDP4213 ,M_2.0"QCIF TFT S_1.17"OLED		12
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0043901	Main FPCB		
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0026201			
7	CN100	CONNECTOR,BOARD TO BOARD	ENBY0027407	40 PIN,0.4 mm,ETC ,AU ,H:1.0MM		
7	CN101	CONNECTOR,BOARD TO BOARD	ENBY0028801	50 PIN,.4 mm,ETC , ,H=1.5, P4S Header		
6	SPCY00	PCB,FLEXIBLE	SPCY0080101	POLYI ,0.4 mm,MULTI-4 ,TRINITY		
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0019401	3.0 ,-2.0 dBd,, ,internal, GSM900/1800/1900/WCDMA2100 , ,QUAD ,-2.0 ,50 ,3.0		41
3	SAFY00	PCB ASSY,MAIN	SAFY0163010			
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0059801			
5	ADCA00	DOME ASSY,METAL	ADCA0061001	5point	Without Color	34
5	SPKY00	PCB,SIDEKEY	SPKY0038701	POLYI ,.2 mm,DOUBLE ,U310 F-SIDEKEY		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0084809			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0075601			
6	C1000	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V ,J,NP0,TC,1005,R/TP		
6	C1001	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V ,J,NP0,TC,1005,R/TP		
6	C1004	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1005	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1006	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1007	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1008	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1009	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		



## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1010	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1011	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1012	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1013	CAP,TANTAL,CHIP	ECTH0004402	33 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C1014	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1015	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1016	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1017	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1018	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1019	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1020	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1021	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C1022	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C1023	CAP,TANTAL,CHIP	ECTH0001903	22 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C1024	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1025	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1026	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1027	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1028	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1029	CAP,TANTAL,CHIP	ECTH0003701	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C1030	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	C1031	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1032	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1033	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C1034	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1035	CAP,FILM,MPP	ECFD0001001	22 nF,10V ,J ,NI ,SMD ,2012 mm,R/TP		
6	C1036	CAP,FILM,MPP	ECFD0000703	3900 pF,16V ,J ,NI ,SMD ,2012 mm,R/TP		
6	C1037	CAP,CERAMIC,CHIP	ECCH0000138	390 pF,50V,K,X7R,HD,1005,R/TP		
6	C1038	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1039	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1040	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1041	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1042	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1043	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1044	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1045	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1046	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1047	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1048	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1050	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1051	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1052	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1053	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1054	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1055	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1056	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C1057	CAP,CHIP,MAKER	ECZH0001106	4700 pF,25V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1058	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1059	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1060	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1061	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1062	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1063	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1065	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C1066	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1067	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1070	CAP,CHIP,MAKER	ECZH0000802	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1071	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1072	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1073	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1074	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	C1075	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1076	INDUCTOR,CHIP	ELCH0004720	1.2 nH,S ,1005 ,R/TP ,		
6	C1077	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1078	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1079	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1081	INDUCTOR,CHIP	ELCH0004720	1.2 nH,S ,1005 ,R/TP ,		
6	C1082	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1083	CAP,TANTAL,CHIP	ECTH0002201	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1084	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1085	CAP,CERAMIC,CHIP	ECCH0000144	1.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C1086	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP		
6	C1087	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1088	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1089	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1090	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1091	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP		
6	C1092	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C1093	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1095	CAP,CERAMIC,CHIP	ECCH0000101	.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1096	CAP,CHIP,MAKER	ECZH0001122	680 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1097	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1098	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1099	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1100	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C1101	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1102	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1103	CAP,TANTAL,CHIP	ECTH0002201	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1104	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1105	CAP,CERAMIC,CHIP	ECCH0000185	5.6 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1106	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1107	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1108	CAP,CHIP,MAKER	ECZH0001121	470 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1109	CAP,FILM,MPP	ECFD0000703	3900 pF,16V ,J ,NI ,SMD ,2012 mm,R/TP		
6	C1110	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1111	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C200	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C202	CAP,CERAMIC,CHIP	ECCH0000157	15 nF,16V,K,X7R,HD,1005,R/TP		
6	C203	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L ,ESR ,1608 ,R/TP		
6	C204	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C206	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0000157	15 nF,16V,K,X7R,HD,1005,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C214	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C224	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C229	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C230	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C233	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C235	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C236	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C237	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C238	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C239	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C240	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C241	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C242	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C243	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C244	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C245	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C246	CAP,CERAMIC,CHIP	ECCH0000161	33 nF,16V,K,X7R,HD,1005,R/TP		
6	C247	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C300	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C301	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C303	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C304	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C305	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C306	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C307	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C308	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C309	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C310	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C400	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C401	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C402	CAP,TANTAL,CHIP	ECTH0005201	33 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C403	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C404	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C408	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C409	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C410	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C411	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C412	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C413	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C414	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C420	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C421	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C422	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C423	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C425	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C426	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C428	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C429	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C430	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C431	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C432	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C433	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C450	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C500	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C502	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C503	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C504	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C505	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C508	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C509	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C510	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C511	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C512	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C513	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C516	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C517	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C519	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C521	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C522	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C523	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C524	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C526	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C528	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C537	CAP,TANTAL,CHIP	ECTH0004402	33 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C538	CAP,TANTAL,CHIP	ECTH0004402	33 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C542	FILTER,EMI/POWER	SFEY0006501	SMD ,3 TERMINAL EMI FILTER		
6	C543	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C544	CAP,TANTAL,CHIP	ECTH0005201	33 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C545	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C546	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C547	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C548	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C549	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C550	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C560	CAP,CERAMIC,CHIP	ECCH0000137	330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C580	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C602	CAP,CERAMIC,CHIP	ECCH0000133	220 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	CN500	CONNECTOR,BOARD TO BOARD	ENBY0019001	24 PIN,.4 mm,STRAIGHT , ,H1.5, FEMALE		
6	CN501	CONNECTOR,I/O	ENRY0006401	18 PIN,0.4 mm,ANGLE , ,H=2.5, Reverse Type		
6	CN502	CONNECTOR,ETC	ENZY0014301	3 PIN,2.5 mm,ETC , ,Battery Connector		
6	CN601	CONNECTOR,BOARD TO BOARD	ENBY0027701	20 PIN,.5 mm,ETC , ,H=3.0, Female		
6	CN602	CONNECTOR,BOARD TO BOARD	ENBY0028901	50 PIN,0.4 mm,ETC , ,H=1.5, P4S Socket		
6	D400	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D401	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D500	DIODE,TVS	EDTY0008601	SOD-323 ,6 V,400 W,R/TP ,PB-FREE		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	D501	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	D502	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	D503	DIODE,TVS	EDTY0006201	SOD-323 ,12 V,350 W,R/TP ,Single Line TVS Diode for ESD		
6	D504	DIODE,TVS	EDTY0008610	SOD-523 ,5 V,250 W,R/TP ,PB-FREE		
6	D600	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D601	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D602	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D650	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	FB1000	FILTER,BEAD,CHIP	SFBH0000903	600 ohm,1005 ,		
6	FB500	FILTER,BEAD,CHIP	SFBH0000909	60 ohm,1005 ,		
6	FB501	FILTER,BEAD,CHIP	SFBH00009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB502	FILTER,BEAD,CHIP	SFBH00009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FL1000	FILTER,SEPERATOR	SFAY0008301	900.1800 ,1900.2100 ,3.6 dB,3.6 dB,30 dB,30 dB,ETC ,Quad band FEM. 5.4*4.0*1.2 Size		
6	FL1001	FILTER,SAW	SFSY0028101	1950 MHz,1.4*1.4 ,SMD ,Pb-free_DCS1900_Rx		
6	FL1002	FILTER,SAW	SFSY0029201	2140 MHz,1.35*1.05*0.6 ,SMD ,Pb-free_WCDMA_Rx_200ohm		
6	FL1003	DUPLEXER,IMT	SDMY0001101	1950 MHz,2140 MHz,1.4 dB,2.0 dB,50 dB,41 dB,3.0*2.5*1.0 ,SMD ,SAW ,; ,2140 ,2110 to 2170 ,1950 ,1920 to 1980 ,2.0 ,1.4 ,3.0x2.5x1.0 ,[empty] ,[empty] ,[empty]		
6	FL600	FILTER,EMI/POWER	SFEY0013101	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 50ohm		
6	FL602	FILTER,EMI/POWER	SFEY0013101	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 50ohm		
6	FL604	FILTER,EMI/POWER	SFEY0013101	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 50ohm		
6	J300	CONN,SOCKET	ENSY0001602	6 PIN,ETC ,5 IRECTIONAL ,2.54 mm,K(GC200)		
6	L1000	INDUCTOR,CHIP	ELCH0010401	2.2 uH,M ,1005 ,R/TP ,		
6	L1001	INDUCTOR,CHIP	ELCH0010401	2.2 uH,M ,1005 ,R/TP ,		
6	L1002	INDUCTOR,CHIP	ELCH0010401	2.2 uH,M ,1005 ,R/TP ,		
6	L1003	INDUCTOR,CHIP	ELCH0001056	2.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1004	INDUCTOR,CHIP	ELCH0010401	2.2 uH,M ,1005 ,R/TP ,		
6	L1005	INDUCTOR,CHIP	ELCH0003816	3.6 nH,S ,1005 ,R/TP ,		
6	L1007	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1008	INDUCTOR,CHIP	ELCH0003816	3.6 nH,S ,1005 ,R/TP ,		
6	L1009	INDUCTOR,CHIP	ELCH0001056	2.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1010	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		



## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	L1011	INDUCTOR,CHIP	ELCH0003817	7.5 nH,J ,1005 ,R/TP ,		
6	L1012	INDUCTOR,CHIP	ELCH0001407	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L1013	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L1014	INDUCTOR,CHIP	ELCH0003817	7.5 nH,J ,1005 ,R/TP ,		
6	L1015	INDUCTOR,CHIP	ELCH0003817	7.5 nH,J ,1005 ,R/TP ,		
6	L1016	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L1017	INDUCTOR,CHIP	ELCH0001407	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L1018	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1019	INDUCTOR,CHIP	ELCH0003818	9.1 nH,J ,1005 ,R/TP ,		
6	L1020	INDUCTOR,CHIP	ELCH0003818	9.1 nH,J ,1005 ,R/TP ,		
6	L1021	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1022	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1023	INDUCTOR,CHIP	ELCH0004723	1.8 nH,S ,1005 ,R/TP ,		
6	L1024	INDUCTOR,CHIP	ELCH0001407	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L1026	INDUCTOR,CHIP	ELCH0001407	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L1027	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	L1028	INDUCTOR,CHIP	ELCH0001423	56 nH,J ,1005 ,R/TP ,PBFREE		
6	L1029	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L1030	INDUCTOR,CHIP	ELCH0001056	2.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1300	INDUCTOR,CHIP	ELCH0001406	4.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1301	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	L300	INDUCTOR,CHIP	ELCH0001550	56 nH,J ,1608 ,R/TP ,		
6	L400	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L401	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L402	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L410	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L600	INDUCTOR,CHIP	ELCH0001022	56 nH,J ,1005 ,R/TP ,Pb Free		
6	Q1000	TR,BJT,ARRAY	EQBA0000301	SC-88A,0.15W,R/TP,NPN/PNP DUAL		
6	Q400	TR,BJT,PNP	EQBP0009901	TSMT6 ,0.5 W,R/TP ,Vceo=-12V, Ic=-3A, hFE=270~680		
6	Q401	TR,BJT,PNP	EQBP0009901	TSMT6 ,0.5 W,R/TP ,Vceo=-12V, Ic=-3A, hFE=270~680		
6	Q402	TR,FET,P-CHANNEL	EQFP0004701	TSOP6 ,1.5 W,20 V,-5 A,R/TP ,P-CHANNEL 20-V(D-S) MOSFET, Pb free		
6	R1003	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R1004	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R1005	RES,CHIP,MAKER	ERHZ0000422	15 Kohm,1/16W ,J ,1005 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R1006	RES,CHIP	ERHY0011601	11 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1007	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R1008	RES,CHIP,MAKER	ERHZ0000522	24 ohm,1/16W ,J ,1005 ,R/TP		
6	R1009	RES,CHIP,MAKER	ERHZ0000512	82 ohm,1/16W ,J ,1005 ,R/TP		
6	R1010	RES,CHIP,MAKER	ERHZ0000307	6200 ohm,1/16W ,F ,1005 ,R/TP		
6	R1011	RES,CHIP,MAKER	ERHZ0000307	6200 ohm,1/16W ,F ,1005 ,R/TP		
6	R1012	RES,CHIP,MAKER	ERHZ0000527	200 ohm,1/6W ,J ,1005 ,R/TP		
6	R1013	RES,CHIP,MAKER	ERHZ0000420	150 ohm,1/16W ,J ,1005 ,R/TP		
6	R1014	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R1015	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1016	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1017	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1018	RES,CHIP,MAKER	ERHZ0000420	150 ohm,1/16W ,J ,1005 ,R/TP		
6	R1019	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1020	RES,CHIP,MAKER	ERHZ0000522	24 ohm,1/16W ,J ,1005 ,R/TP		
6	R1021	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1022	RES,CHIP,MAKER	ERHZ0000527	200 ohm,1/6W ,J ,1005 ,R/TP		
6	R1023	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1024	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1025	RES,CHIP,MAKER	ERHZ0000502	6200 ohm,1/16W ,J ,1005 ,R/TP		
6	R1026	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1027	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1028	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R1029	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R1030	RES,CHIP	ERHY0000105	51 ohm,1/16W,F,1005,R/TP		
6	R1031	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1032	THERMISTOR	SETY0001401	NTC ,68 Kohm,SMD ,		
6	R1033	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1034	RES,CHIP	ERHY0011601	11 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1035	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1036	RES,CHIP,MAKER	ERHZ0000267	3300 ohm,1/16W ,F ,1005 ,R/TP		
6	R1037	RES,CHIP,MAKER	ERHZ0000286	4700 ohm,1/16W ,F ,1005 ,R/TP		
6	R1038	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R201	RES,CHIP,MAKER	ERHZ0000423	150 Kohm,1/16W ,J ,1005 ,R/TP		
6	R203	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R204	RES,CHIP,MAKER	ERHZ0000205	1 Mohm,1/16W ,F ,1005 ,R/TP		
6	R205	RES,CHIP,MAKER	ERHZ0000231	180 Kohm,1/16W ,F ,1005 ,R/TP		
6	R206	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R207	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R208	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R209	RES,CHIP,MAKER	ERHZ0000441	22 ohm,1/16W ,J ,1005 ,R/TP		
6	R210	RES,CHIP,MAKER	ERHZ0000231	180 Kohm,1/16W ,F ,1005 ,R/TP		
6	R211	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R213	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R215	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R216	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R217	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R218	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R220	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R221	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R222	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R300	RES,CHIP,MAKER	ERHZ0000485	4700 ohm,1/16W ,J ,1005 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R302	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R304	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R400	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R401	RES,CHIP	ERHY0008602	0.1 ohm,1/4W ,J ,2012 ,R/TP		
6	R402	RES,CHIP,MAKER	ERHZ0000487	470 Kohm,1/16W ,J ,1005 ,R/TP		
6	R403	RES,CHIP,MAKER	ERHZ0004201	121000 ohm,1/16W ,F ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R406	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R407	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R408	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R409	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R500	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R501	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R502	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R503	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R505	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R506	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R507	RES,CHIP,MAKER	ERHZ0000205	1 Mohm,1/16W ,F ,1005 ,R/TP		
6	R508	RES,CHIP,MAKER	ERHZ0000487	470 Kohm,1/16W ,J ,1005 ,R/TP		
6	R513	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R516	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R521	RES,CHIP,MAKER	ERHZ0000295	51 Kohm,1/16W ,F ,1005 ,R/TP		
6	R524	RES,CHIP	ERHY0000101	0 ohm,1/16W,F,1005,R/TP		
6	R526	RES,CHIP	ERHY0000101	0 ohm,1/16W,F,1005,R/TP		
6	R529	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R530	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R531	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R532	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP		
6	R540	RES,CHIP,MAKER	ERHZ0000231	180 Kohm,1/16W ,F ,1005 ,R/TP		
6	R551	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R600	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R602	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R604	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R605	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	S500	CONN,SOCKET	ENSY0014101	8 PIN,ETC , , 1.1 mm,T-Flash Memory Socket		
6	SW1000	CONN,RF SWITCH	ENWY0002304	STRAIGHT ,SMD ,0.8 dB,MUSE MODEL		
6	U1000	IC	EUSY0203802	QFN ,56 PIN,R/TP ,GSM/WCDMA TRANSMITTER & GSM RECEIVER		
6	U1001	PAM	SMPY0014001	35.5 dBm,56 % , A, dBc, dB,6x6x1.15 ,SMD ,Tri Band		
6	U1002	PAM	SMPY0014201	28 dBm,40 % ,465 mA,-44 dBc,26.5 dB,4x4x1.1 ,SMD ,		
6	U1003	IC	EUSY0186102	4-bump Micro SMD ,4 PIN,R/TP ,RF Power Detector for CDMA and WCDMA , -15 to +15dBm		
6	U1004	COUPLER,RF DIRECTIONAL	SCDY0003402	-20 dB,-0.25 dB,-35 dB,1.0*0.58*0.35 ,SMD ,1850M ~ 1910M, 4pin, Pb Free		
6	U1005	IC	EUSY0246002	QFN ,48 PIN,R/TP ,UMTS-1900/-2100 and GPS RF Receiver IC		
6	U200	IC	EUSY0279002	CSP ,409 PIN,R/TP ,WCDMA BASE BAND SLEEP CURRENT IMPROVEMENT VERSION		
6	U300	DIODE,TVS	EDTY0008607	SC70-6L ,6 V,200 W,R/TP ,PB-FREE		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	U301	IC	EUSY0297301	11*14*1.2 ,225 PIN,R/TP ,NAND(90nm), DRAM(90nm)		
6	U400	IC	EUSY0306302	BCCS ,84 PIN,R/TP ,7x7, MSMC(1.2V), pbfree		
6	U500	MICROPHONE	SUMY0010602	UNIT , -42 dB,6.15*3.76*1.25 ,Silicon mic , , -42 ,300 ,OMNI ,[empty] ,6.15*3.76*1.25 ,SMD		
6	U501	IC	EUSY0238701	DFN33-12 ,12 PIN,R/TP ,DFN33-12,12PIN,1X/1.5X/2X CHARGE PUMP 3LED,150mA		
6	U502	IC	EUSY0232812	SON1612-6 ,6 PIN,R/TP ,2.8V, 150mA LDO		
6	U503	DIODE,TVS	EDTY0008607	SC70-6L ,6 V,200 W,R/TP ,PB-FREE		
6	U504	IC	EUSY0232812	SON1612-6 ,6 PIN,R/TP ,2.8V, 150mA LDO		
6	U506	IC	EUSY0077701	SC70-5 ,5 PIN,R/TP ,1.8V Low Voltage Comparator with Rail-to-Rail Input, Pb Free		
6	VA500	VARISTOR	SEVY0003801	18 V , ,SMD ,		
6	VA501	VARISTOR	SEVY0003801	18 V , ,SMD ,		
6	VA502	VARISTOR	SEVY0003801	18 V , ,SMD ,		
6	VA503	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	VA504	VARISTOR	SEVY0003801	18 V , ,SMD ,		
6	VA505	VARISTOR	SEVY0003801	18 V , ,SMD ,		
6	VA506	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA507	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA508	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA509	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA510	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA511	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA512	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA513	VARISTOR	SEVY0003602	5.6 V , ,SMD ,1005, 60pF		
6	VA600	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA601	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA602	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA603	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA604	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA605	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA608	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA609	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA611	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA612	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA613	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	VA614	VARISTOR	SEVY0001001	14 V , SMD ,50pF, 1005		
6	VA620	VARISTOR	SEVY0001001	14 V , SMD ,50pF, 1005		
6	X1000	VCO	EXSC0009901	MHz, PPM, pF,SMD ,5.0*4.0*1.3 ,824M~915M, 1710M~1910M, 12pin, DBDO		
6	X1001	VTCTCXO	EXSK0006102	19.2 MHz,2.5 PPM,40 pF,SMD ,3.2*2.5*1.05 ,2ppm at -30 to +85, AFC 0.4V to 2.4V, Double Room		
6	X200	RESONATOR	EXRY0002401	48 MHz,,5 %,14 pF,SMD ,2.0*1.2*0.65 ,Outgoing Tolerance 0.2%, 0.05% at -40°C ~ +85C, Built-In Cap		
6	X400	X-TAL	EXXY0018701	32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 ,		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0074601			
6	C525	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C527	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C530	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C534	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C535	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C539	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C540	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C541	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C600	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C601	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C603	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	FL601	FILTER,EMI/POWER	SFEY0013101	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 50ohm		
6	FL603	FILTER,EMI/POWER	SFEY0013101	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 50ohm		
6	LD600	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD601	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD602	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD603	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD604	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD605	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD606	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD607	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		
6	LD608	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , ,[empty] ,[empty] ,[empty] ,[empty]		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	LD609	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	LD610	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	LD611	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	LD612	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	LD613	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	LD614	DIODE,LED,CHIP	EDLH0012901	pastel blue ,1608 ,R/TP , , , , , [empty] , [empty] , [empty]		
6	R509	RES,CHIP,MAKER	ERHZ0000487	470 Kohm,1/16W ,J ,1005 ,R/TP		
6	R510	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R512	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R514	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R515	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R517	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R518	RES,CHIP,MAKER	ERHZ0000507	68 Kohm,1/16W ,J ,1005 ,R/TP		
6	R519	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R520	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R522	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R525	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R527	RES,CHIP,MAKER	ERHZ0000507	68 Kohm,1/16W ,J ,1005 ,R/TP		
6	R528	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R601	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R603	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R606	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R607	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R608	RES,CHIP	ERHY0000101	0 ohm,1/16W,F,1005,R/TP		
6	R609	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R610	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R611	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R612	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R613	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R614	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R615	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R616	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		

## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R617	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R618	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R619	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R620	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R621	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R622	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R623	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	RA600	RES,ARRAY,R	ERNR0000403	10000 ohm, ohm,8 PIN,J ,1/32 W ,SMD ,R/TP		
6	U505	IC	EUSY0223002	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V		
6	U507	IC	EUSY0304701	TDFN ,10 PIN,R/TP ,Dual SPDT		
6	U508	IC	EUSY0304901	TDFN ,8 PIN,R/TP ,1.4W Mono AB-Class Audio AMP ,8 PIN,R/TP ,SPK Audio AMP		
6	U600	IC	EUSY0129503	2x2 mm MLPD ,3 PIN,R/TP ,Hall Effect Switch, Pb Free		
6	VA606	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA607	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA610	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA615	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA616	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA617	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA618	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA619	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	ZD600	DIODE,TVS	EDTY0007501	SOD-523 ,5 V,240 W,R/TP ,Vc 12.5V , 160pF , 1.6*0.8*.06		
5	SPFY00	PCB,MAIN	SPFY0131401	FR-4 ,0.8 mm,STAGGERED-8 ,TRINITY		
3	SAJY00	PCB ASSY,SUB	SAJY0019101			39
4	SAJB00	PCB ASSY,SUB,INSERT	SAJB0008301			
4	SAJE00	PCB ASSY,SUB,SMT	SAJE0013501			
5	SAJC00	PCB ASSY,SUB,SMT BOTTOM	SAJC0012401			
6	ANT700	ANTENNA,GSM,FIXED	SNGF0018801	3.0 , -2.0 dBd , chip type , ,SINGLE , -2.0 ,50 ,3.0		
6	BAT700	BATTERY,CELL,LITHIUM	SBCL0001305	3 V,1 mAh,COIN ,SMT Temp.260 degree. PB-Free B/B		
6	C701	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C702	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C703	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C704	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C705	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		



## 10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C706	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C707	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C708	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C709	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C710	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C711	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C750	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	R700	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R701	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R702	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R703	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R704	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R711	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	U703	MODULE,ETC	SMZY0010701	Bluetooth RF Module, 4.5*3.2*1.2		
6	U704	IC	EUSY0084701	SSOP5-P-A ,6 PIN,R/TP ,Inverter, Pb Free		
6	VA701	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
5	SAJD00	PCB ASSY,SUB,SMT TOP	SAJD0014201			
6	C720	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C721	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	CON702	CONNECTOR,BOARD TO BOARD	ENBY0029201	20 PIN,0.5 mm,ETC , ,H=3.0		
6	R709	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R710	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	U705	IC	EUSY0197203	2.1x2.0x0.8 ,3 PIN,R/TP ,MR Sensor, Pb Free		
5	SPJY00	PCB,SUB	SPJY0032001	FR-4 ,0.8 mm,MULTI-4 ,TRINITY		

### 10.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	SBPP00	BATTERY PACK,LI-POLYMER	SBPP0019402	3.7 V,800 mAh,1 CELL,PRISMATIC ,KU311 ORF BATT, Orange Logo, Pb-Free ; ,3.7 ,800mAh ,0.2C ,PRISMATIC ,50x34x38 , ,BLACK ,Hardpack ,Black color Batt, Europe Label	Black	
3	SGDY00	DATA CABLE	SGDY0010901	LG-US03K ,18pin USB DataCable		
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0005520	; ,10mW ,32ohm ,112dB ,20HZ ,20HZ [empty] ,BLACK ,18P MMI CONNECTOR ,Plug Mold( Abnormal)		
3	SSAD00	ADAPTOR,AC-DC	SSAD0021002	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		
		ADAPTOR,AC-DC	SSAD0021001	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		
		ADAPTOR,AC-DC	SSAD0021004	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		
		ADAPTOR,AC-DC	SSAD0021005	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		
		ADAPTOR,AC-DC	SSAD0021006	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		
		ADAPTOR,AC-DC	SSAD0021008	100-240V ,5060 Hz,4.8 V,0.9 A,CE&CB ,18pin Plug ; , , , , , [empty] ,I/O CONNECTOR ,		

## Note

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